(19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 18 January 2007 (18.01.2007)

PCT

(10) International Publication Number WO 2007/008573 A3

- (51) International Patent Classification: *H04L 12/56* (2006.01) *H04L 12/28* (2006.01) *H04Q 7/38* (2006.01)
- (21) International Application Number:

PCT/US2006/026308

- (22) International Filing Date: 6 July 2006 (06.07.2006)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:

60/697,504 7 July 2005 (07.07.2005) US 60/712,320 29 August 2005 (29.08.2005) US 11/240,045 30 September 2005 (30.09.2005) US

- (71) Applicant (for all designated States except US): QUAL-COMM INCORPORATED [US/US]; 5775 Morehouse Drive, San Diego, California 92121 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): DRAVIDA, Subrahmanyam [US/US]; 20 Hemingway Street, Shrewsbury, Massachusetts 01545 (US). WALTON, Jay Rodney [US/US]; 85 Highwoods Lane, Carlisle, Massachusetts 01741 (US). NANDA, Sanjiv [US/US]; 16808 Daza Drive, Ramona, California 92065 (US). SURINENI, Shravan K. [IN/US]; 21 Royal Crest Drive, #9, Marlborough, Massachusetts 01752 (US).

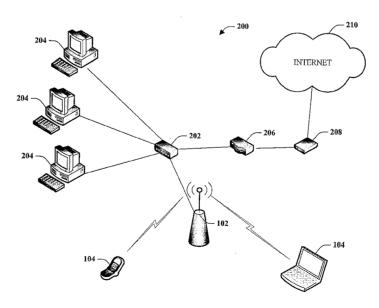
- (74) Agents: WADSWORTH, Philip R. et al.; 5775 Morehouse Drive, San Diego, California 92121 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, 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, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, 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(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

[Continued on next page]

(54) Title: METHODS AND DEVICES FOR INTERWORKING OF WIRELESS WIDE AREA NETWORKS AND WIRELESS LOCAL AREA NETWORKS OR WIRELESS PERSONAL AREA NETWORKS



(57) Abstract: Embodiments describe utilizing time-based information to improve communication in a wireless network. A method can include receiving beacon information from at least one access point and utilizing time-stamp information associated with the beacon information to determine whether to hand off communication with a second access point. According to other embodiments the method can further include detecting beacon quality is below a threshold level and transmitting a poor beacon quality message. Information relating to a plurality of alternate access points can be received in response to the transmitted poor beacon quality message.



WO 2007/008573 A3



Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report: $$10{\rm \;May\;}2007$$

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.

INTERNATIONAL SEARCH REPORT

International application No PCT/US2006/026308

A. CLASSIFICATION OF SUBJECT MATTER INV. H04L12/56 H04Q7 H04Q7/38 H04L12/28 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 H040 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 Citation of document, with indication, where appropriate, of the relevant passages Category* Belevant to claim No. χ US 2004/066757 A1 (MOLTENI MARCO [FR] ET . 1,7,8, AL) 8 April 2004 (2004-04-08) 12,19,21 Y abstract 2-6, 9-11,20, 23,24 figures 1,2a,3 paragraph [0067] paragraph [0103] paragraph [0110] paragraph [0113] paragraph [0118] paragraphs [0159], [0165]claim 4 -/--X X Further documents are listed in the continuation of Box C. See patent family annex. Special categories of cited documents: *T* later document published after the international filing date or priority date and not in conflict with the application but "A" document defining the general state of the art which is not considered to be of particular relevance cited to understand the principle or theory underlying the invention "E" earlier document but published on or after the international "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to filing date 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) involve an inventive step when the document is taken alone 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. document referring to an oral disclosure, use, exhibition or other means document published prior to the international filing date but later than the priority date claimed "&" document member of the same patent family Date of the actual completion of the international search Date of mailing of the international search report 26 February 2007 05/03/2007 Name and mailing address of the ISA/ Authorized officer 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 Möll, Hans-Peter

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/026308

PC1/US2006/026308 Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
tion). DOCUMENTS CONSIDERED TO BE RELEVANT		
Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	
US 2004/063426 A1 (HUNKELER TERESA [CA]) 1 April 2004 (2004-04-01)	13	
abstract	3-6, 9-11,20, 24	
figures 1,3,5 paragraphs [0023] - [0025] paragraphs [0031] - [0041]		
US 2004/137908 A1 (SINIVAARA HASSE [FI] ET AL SINIVAARA HASSE [FI] ET AL) 15 July 2004 (2004-07-15) abstract figures 2c,3 paragraphs [0067] - [0088]	2,23	
US 2005/058112 A1 (LAHEY KEVIN [US] ET AL) 17 March 2005 (2005-03-17) abstract paragraphs [0045] - [0047] paragraph [0049] paragraph [0051] paragraphs [0054], [0055]	1-25	
	US 2004/063426 A1 (HUNKELER TERESA [CA]) 1 April 2004 (2004-04-01) abstract figures 1,3,5 paragraphs [0023] - [0025] paragraphs [0031] - [0041] US 2004/137908 A1 (SINIVAARA HASSE [FI] ET AL SINIVAARA HASSE [FI] ET AL SINIVAARA HASSE [FI] ET AL) 15 July 2004 (2004-07-15) abstract figures 2c,3 paragraphs [0067] - [0088] US 2005/058112 A1 (LAHEY KEVIN [US] ET AL) 17 March 2005 (2005-03-17) abstract paragraphs [0045] - [0047] paragraph [0049] paragraph [0051]	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2006/026308

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004066757 A	08-04-2004	AU 2003260139 A1 CA 2492466 A1 CN 1685669 A EP 1582033 A2 WO 2004034647 A2 US 2004066759 A1	04-05-2004 22-04-2004 19-10-2005 05-10-2005 22-04-2004 08-04-2004
US 2004063426 A	01-04-2004	AU 2003278997 A1 CA 2500658 A1 EP 1550325 A1 JP 2006501785 T KR 20050044936 A KR 20050096985 A MX PA05003542 A W0 2004032539 A1 US 2005288021 A1	23-04-2004 15-04-2004 06-07-2005 12-01-2006 13-05-2005 06-10-2005 17-06-2005 15-04-2004 29-12-2005
US 2004137908 A	. 15-07-2004	CN 1714594 A US 2004202141 A1	28-12-2005 14-10-2004
US 2005058112 A	17-03-2005	WO 2005036333 A2	21-04-2005