



(51) **International Patent Classification:**
H04B 7/02 (2006.01) **H04B 7/14** (2006.01)
H04W 72/12 (2009.01)

(21) **International Application Number:**
PCT/MY2009/000186

(22) **International Filing Date:**
4 November 2009 (04.11.2009)

(25) **Filing Language:** English

(26) **Publication Language:** English

(30) **Priority Data:**
PI 20084394 4 November 2008 (04.11.2008) MY

(71) **Applicant (for all designated States except US):** **MIMOS BERHAD** [MY/MY]; Technology Park of Malaysia, Bukit Jalil, 57000 Kuala Lumpur (MY).

(72) **Inventors; and**

(75) **Inventors/Applicants (for US only):** **HAFIZAL Mohamad** [MY/MY]; c/o MIMOS BERHAD, Technology Park of Malaysia, Bukit Jalil, 57000 Kuala Lumpur (MY). **SAEED, Rashid Abdelhaleem** [MY/MY]; c/o MIMOS BERHAD, Technology Park of Malaysia, Bukit Jalil, 57000 Kuala Lumpur (MY). **AZIZUL RAHMAN Mohd Shariff** [MY/MY]; c/o MIMOS BERHAD, Technology Park of Malaysia, Bukit Jalil, 57000 Kuala Lumpur (MY). **BORHANUDDIN, Mohd Ali** [MY/MY]; c/o Mimos Berhad, Technology Park of Malaysia, Bukit Jalil, 57000 Kuala Lumpur (MY).

(74) **Agent:** **MOHAN, K.**; Adastra Intellectual Property Sdn Bhd, P.O.Box 43 Suite 2B Level 7, Menara Dato Onn, Putra World Trade Center, 45 Jalan Tun Ismail, 50480 Kuala Lumpur (MY).

(81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, 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, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

[Continued on next page]

(54) **Title:** COOPERATIVE RELAYING DATA METHOD AND SYSTEM FOR WIRELESS MESH NETWORK

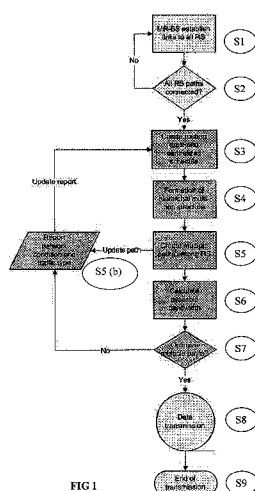


FIG 1

(57) **Abstract:** The present invention discloses a method and system of cooperative data relay in a wireless mesh network. The system comprises at least one multi-hop relay base station (MR-BS) (100) and a plurality of relay station (RS) (200) which are configured to support mesh connections. The method in accordance with the preferred embodiments of the present invention provides capabilities to enable optimal data transmission by way of cooperative relay between the relay stations (RS) (200). Data transmission is initiated upon established the optimized multiple paths with respect to the relay stations (RS) (200). The determination of the optimized multiple paths is based the details of relays stations (RS) (200) provided to the reference table and centralized scheduling at the multi-hop relay station (MR-BS) (100). The reference table and centralized scheduling include, but not limiting to, all details and status pertaining to the plurality of relay stations (RS) (200) within the network, network condition and traffic type.



WO 2010/053348 A3



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
19 August 2010

A. CLASSIFICATION OF SUBJECT MATTER***H04B 7/02(2006.01)i, H04W 72/12(2009.01)i, H04B 7/14(2006.01)i***

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)

H04B 7/02; H04B 7/14; H04L 12/28; H04M 1/00; H04Q 7/00; H04Q 7/20; H04Q 7/22

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: wireless mesh, relay system, optimal routing, centralized schedule, hierarchical multi-hop structure;

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008-0123584 A1 (BEHRENDT MICHAEL et al.) 29 May 2008 See abstract; paragraph [0043] - paragraph [0050], paragraph [0127] - paragraph [0132]; figures 8-11.	1-11
A	US 2008-0227461 A1 (DAYAL PRANAV et al.) 18 September 2008 See all documents.	1-11
A	US 2008-0108355 A1 (OLESZCZUK ANTONI) 08 May 2008 See all documents.	1-11
A	US 2008-0171551 A1 (ZHU CHENXI et al.) 17 July 2008 See all documents.	1-11



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"Y" 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 member of the same patent family

Date of the actual completion of the international search

18 JUNE 2010 (18.06.2010)

Date of mailing of the international search report

23 JUNE 2010 (23.06.2010)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-
gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

SEONG, KYOUNG A

Telephone No. 82-42-481-8171



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/MY2009/000186

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008-0123584 A1	29.05.2008	WO 2008-021146 A2	21.02.2008
US 2008-0227461 A1	18.09.2008	CA 2678411-A1	25.09.2008
		EP 2135379 A1	23.12.2009
		KR 10-2009-0117907 A	13.11.2009
		TW 200849855 A	16.12.2008
		WO 2008-115826 A1	25.09.2008
US 2008-0108355 A1	08.05.2008	CN 101174874 A	07.05.2008
		CN 101174874 C0	07.05.2008
		EP 1919135 A2	07.05.2008
		JP 2008-118659 A	22.05.2008
		KR 10-0929275 B1	27.11.2009
		KR 10-2008-0040609 A	08.05.2008
		KR 10-2009-0101141 A	24.09.2009
		KR 10-2010-0051599 A	17.05.2010
		TW 200826538 A	16.06.2008
US 2008-0171551 A1	17.07.2008	None	