

(51) International Patent Classification:
H04W 74/04 (2009.01)(21) International Application Number:
PCT/US2013/043593(22) International Filing Date:
31 May 2013 (31.05.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/657,643 8 June 2012 (08.06.2012) US
13/905,847 30 May 2013 (30.05.2013) US(71) Applicant: MARVELL WORLD TRADE LTD.
[BB/BB]; L'Horizon Gunsite Road, BB 14027 Brittons
Hill, St. Michael (BB).

(72) Inventor; and

(71) Applicant (for US only): LIU, Yong [CN/US]; 1625
Westmont Ave., Campbell, California 95008 (US).(74) Agents: WIGGINS, Michael, D. et al.; Harness, Dickey &
Pierce, P.L.C., P.O. Box 828, Bloomfield Hills, Michigan
48303 (US).(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, BN, 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, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC,
SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, 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, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, 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))

Published:

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

— with amended claims (Art. 19(1))

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

13 March 2014

Date of publication of the amended claims:

1 May 2014

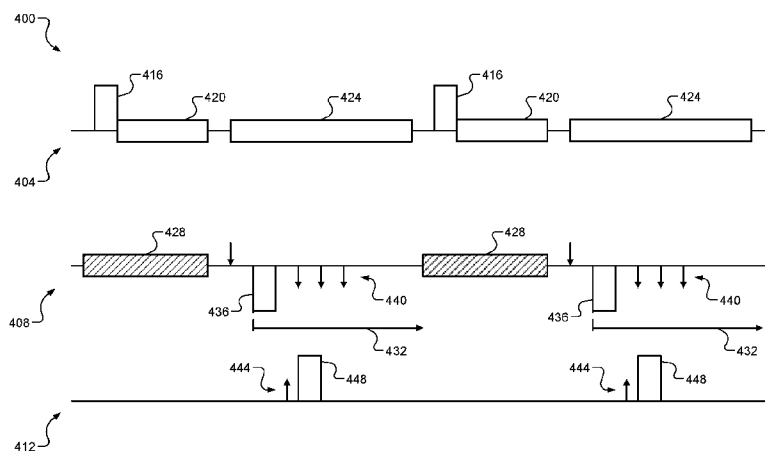
(54) Title: METHOD AND APPARATUS FOR RELAYING COMMUNICATION BETWEEN AN ACCESS POINT AND A
STATION IN A WIRELESS NETWORK

FIG. 4

(57) Abstract: A network including an access point, a client station, and a proxy station. The proxy station is configured to communicate with the access point during a first period. During the first period the proxy station is configured to receive, from the access point, downlink data intended for the client station, and transmit, to the access point, uplink data received from the client station and intended for the access point. The proxy station is further configured to communicate with the client station during a second period. During the second period the proxy station is configured to receive, from the client station, the uplink data intended for the access point, and transmit, to the client station, the downlink data intended for the client station.



AMENDED CLAIMS
received by the International Bureau on 18 February 2014 (18.02.2014)

CLAIMS

What is Claimed is:

1. A network, comprising:
an access point;
5 a client station; and
a proxy station configured to
communicate with the access point during a first period, wherein
during the first period the proxy station is configured to i) receive, from the
access point via a communication medium, downlink data intended for the
10 client station, and ii) transmit, to the access point via the communication
medium, uplink data received from the client station and intended for the
access point,
control scheduling of access, by the client station, to the
communication medium, and
15 communicate with the client station during a second period
according to the access scheduled by the proxy station, wherein during the
second period the proxy station is configured to i) receive, from the client
station via the communication medium, the uplink data intended for the access
point, and ii) transmit, to the client station via the communication medium, the
20 downlink data intended for the client station.
2. The network of claim 1, wherein the proxy station is configured to, prior
to the first period, instruct the client station not to communicate during the first
period.
3. The network of claim 1, wherein the proxy station is configured to, prior
25 to the first period, transition from a first channel to a second channel, and
wherein the proxy station is configured to i) communicate with the client station
using the first channel, and ii) communicate with the access point using the
second channel.

4. The network of claim 1, wherein the proxy station is configured to receive a beacon from the access point during the first period.
5. The network of claim 1, wherein the proxy station is configured to store the downlink data intended for the client station during the first period.
- 5 6. The network of claim 1, wherein the proxy station is configured to store the uplink data intended for the access point during the second period.
7. The network of claim 1, wherein the client station is configured to poll the proxy station for the downlink data during the second period.
8. The network of claim 1, wherein the proxy station is configured to store
10 the uplink data intended for the access point during the second period.
9. The network of claim 1, wherein the uplink data and the downlink data include one or more frames of data, each of the frames of data including an identifier of the proxy station.
10. The network of claim 1, wherein the uplink data includes one or more
15 frames of data, wherein each of the frames of data includes an indication of whether the uplink data is intended for the proxy station.
11. A method of operating a network including an access point, a client station, and a proxy station, the method comprising:
using the proxy station,
20 communicating with the access point during a first period, wherein during the first period the proxy station i) receives, from the access point via a communication medium, downlink data intended for the client station, and ii) transmits, to the access point via the communication medium, uplink data received from the client station and intended for the access point,

controlling scheduling of access, by the client station, to the communication medium, and

communicating with the client station during a second period according to the access scheduled by the proxy station, wherein during the second period
5 the proxy station i) receives, from the client station via the communication medium, the uplink data intended for the access point, and ii) transmits, to the client station via the communication medium, the downlink data intended for the client station.

12. The method of claim 11, further comprising, using the proxy station prior
10 to the first period, instructing the client station not to communicate during the first period.

13. The method of claim 11, further comprising, using the proxy station prior to the first period:
transitioning from a first channel to a second channel;
15 communicating with the client station using the first channel; and
communicating with the access point using the second channel.

14. The method of claim 11, further comprising, using the proxy station, receiving a beacon from the access point during the first period.

15. The method of claim 11, further comprising, using the proxy station,
20 storing the downlink data intended for the client station during the first period.

16. The method of claim 11, further comprising, using the proxy station, storing the uplink data intended for the access point during the second period.

17. The method of claim 11, further comprising, using the client station, polling the proxy station for the downlink data during the second period.

18. The method of claim 11, further comprising, using the proxy station, storing the uplink data intended for the access point during the second period.

19. The method of claim 11, wherein the uplink data and the downlink data include one or more frames of data, each of the frames of data including an
5 identifier of the proxy station.

20. The method of claim 11, wherein the uplink data includes one or more frames of data, wherein each of the frames of data includes an indication of whether the uplink data is intended for the proxy station.