



US009179495B1

(12) **United States Patent**
Scherzer et al.

(10) **Patent No.:** **US 9,179,495 B1**
(45) **Date of Patent:** **Nov. 3, 2015**

(54) **IMPLEMENTING "ALL WIRELESS"
NETWORK OVER WIFI EQUIPMENT USING
"SCHEDULED TDMA"**

(75) Inventors: **Shimon B. Scherzer**, Sunnyvale, CA
(US); **Patrick A. Worfolk**, Campbell,
CA (US); **Armin D. Haken**, San
Francisco, CA (US); **Subburajan
Ponnuswamy**, Folsom, CA (US); **Ronen
Vainish**, Sunnyvale, CA (US)

(73) Assignee: **HEWLETT-PACKARD
DEVELOPMENT COMPANY, L.P.**,
Houston, TX (US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 1625 days.

(21) Appl. No.: **10/615,095**

(22) Filed: **Jul. 8, 2003**

(51) **Int. Cl.**
H04W 4/00 (2009.01)
H04W 84/12 (2009.01)

(52) **U.S. Cl.**
CPC **H04W 84/12** (2013.01)

(58) **Field of Classification Search**
CPC H04W 84/12; H04W 84/18; H04W 74/004
USPC 370/463, 442, 238, 328; 455/522, 502;
375/356

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,577,872 B1 *	6/2003	Lundh et al.	455/502
6,920,148 B1 *	7/2005	Kato	370/442
7,088,795 B1 *	8/2006	Aiello et al.	375/356
2001/0031621 A1 *	10/2001	Schmutz	455/7
2001/0031624 A1 *	10/2001	Schmutz	455/13.4
2002/0078072 A1 *	6/2002	Tan et al.	707/201
2002/0105970 A1 *	8/2002	Shvodian	370/468
2002/0145978 A1 *	10/2002	Batsell et al.	370/238
2002/0176396 A1 *	11/2002	Hammel et al.	370/347
2002/0196749 A1 *	12/2002	Eyuboglu et al.	370/328
2003/0058828 A1	3/2003	Shearer, III	
2003/0067891 A1 *	4/2003	Jones et al.	370/328
2004/0038697 A1 *	2/2004	Attar et al.	455/522
2004/0052227 A1 *	3/2004	Judd et al.	370/334
2004/0090312 A1 *	5/2004	Manis et al.	340/310.02
2004/0100989 A1 *	5/2004	Chiu et al.	370/463
2004/0160986 A1 *	8/2004	Perlman	370/480
2004/0181569 A1 *	9/2004	Attar et al.	709/200
2004/0203791 A1 *	10/2004	Pan et al.	455/442
2004/0208140 A1 *	10/2004	Noguchi et al.	370/328
2005/0102529 A1 *	5/2005	Buddhikot et al.	713/200
2006/0056492 A1 *	3/2006	Honda	375/132
2009/0154405 A1 *	6/2009	Choi et al.	370/329

* cited by examiner

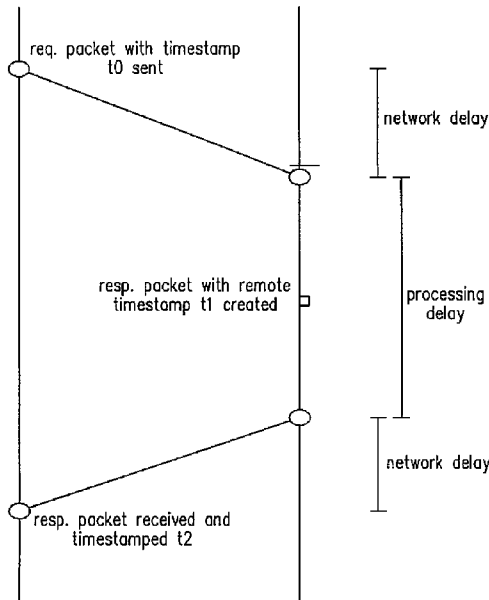
Primary Examiner — Wayne Cai

(74) *Attorney, Agent, or Firm* — Van Cott, Bagley, Cornwall
& McCarthy

(57) **ABSTRACT**

A technique is disclosed to schedule frame transmissions in a
wireless network utilizing scheduled TDMA by synchroniz-
ing clocks in repeater and backhaul access points.

19 Claims, 9 Drawing Sheets



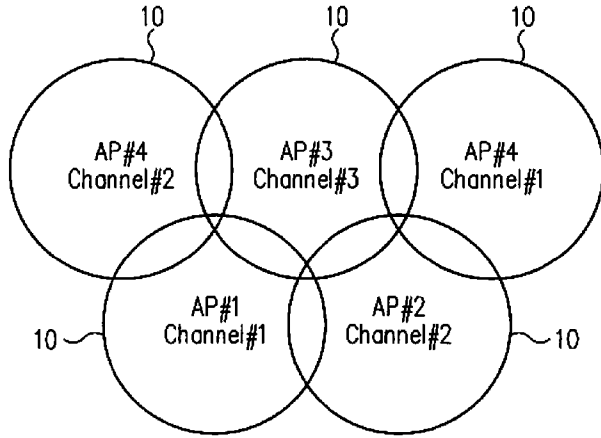


FIG. 1A

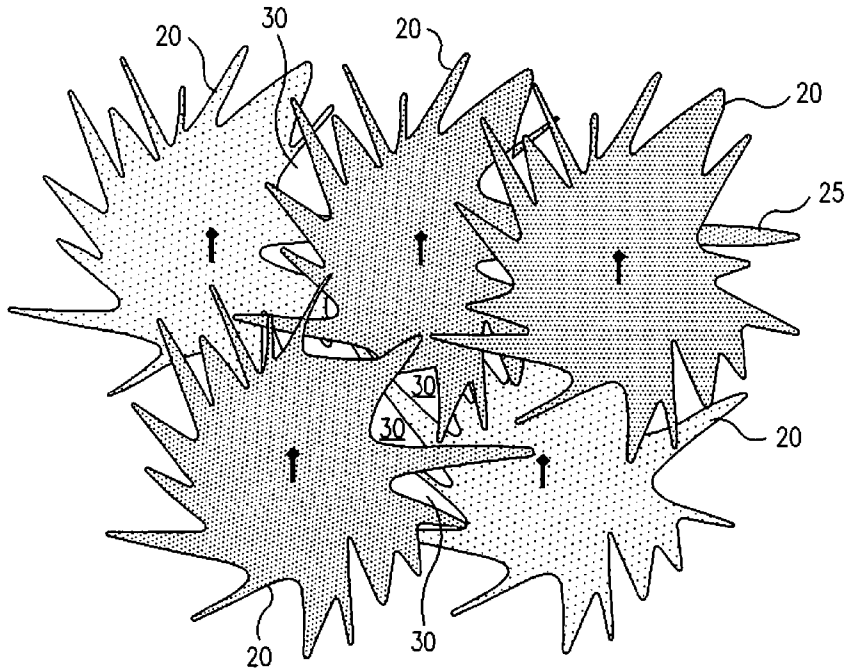


FIG. 1B

PRIOR ART

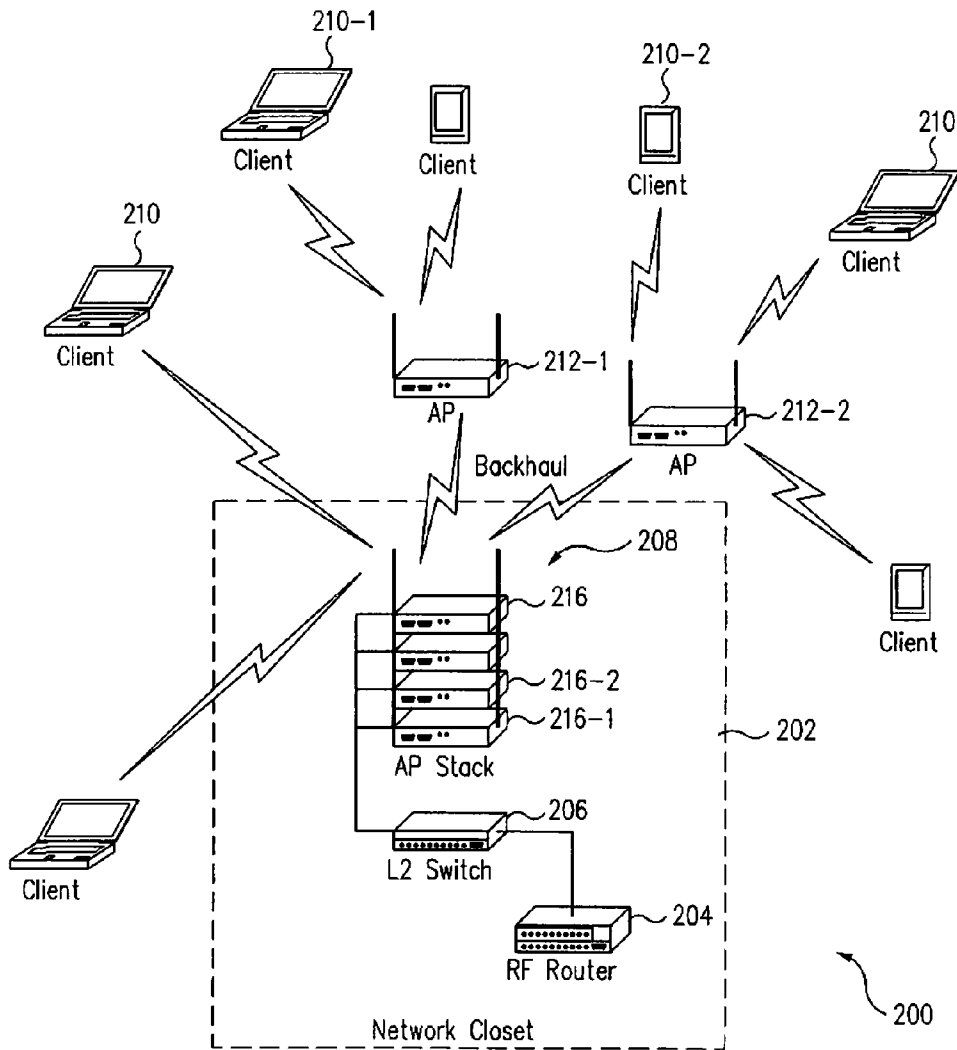


FIG. 2

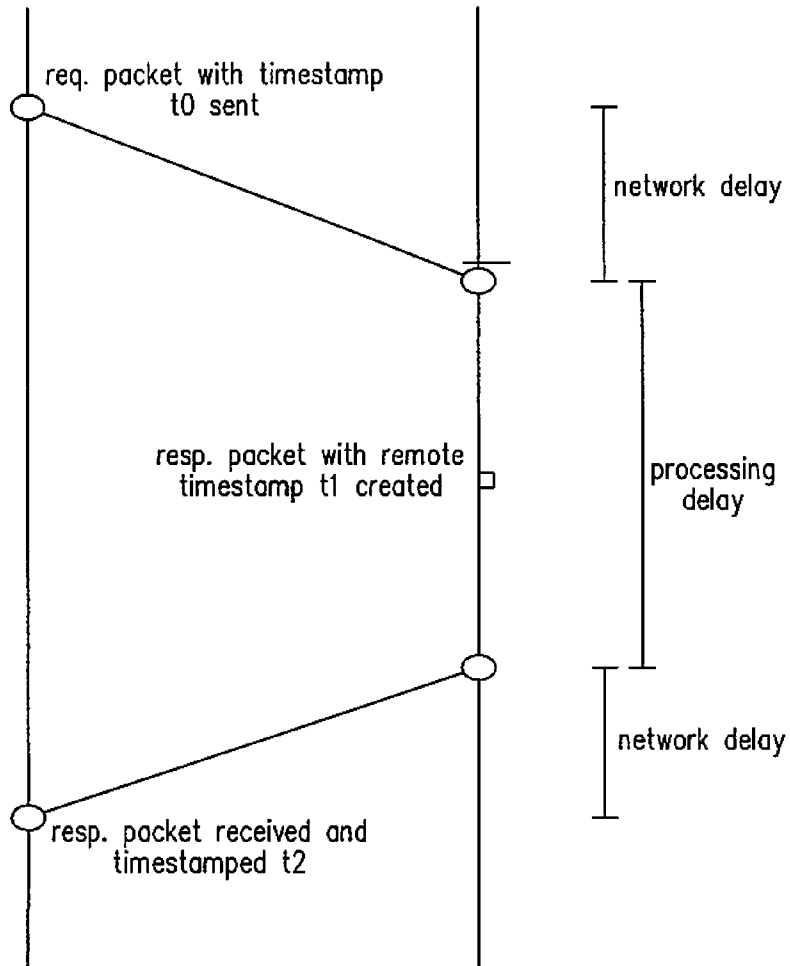


FIG. 3

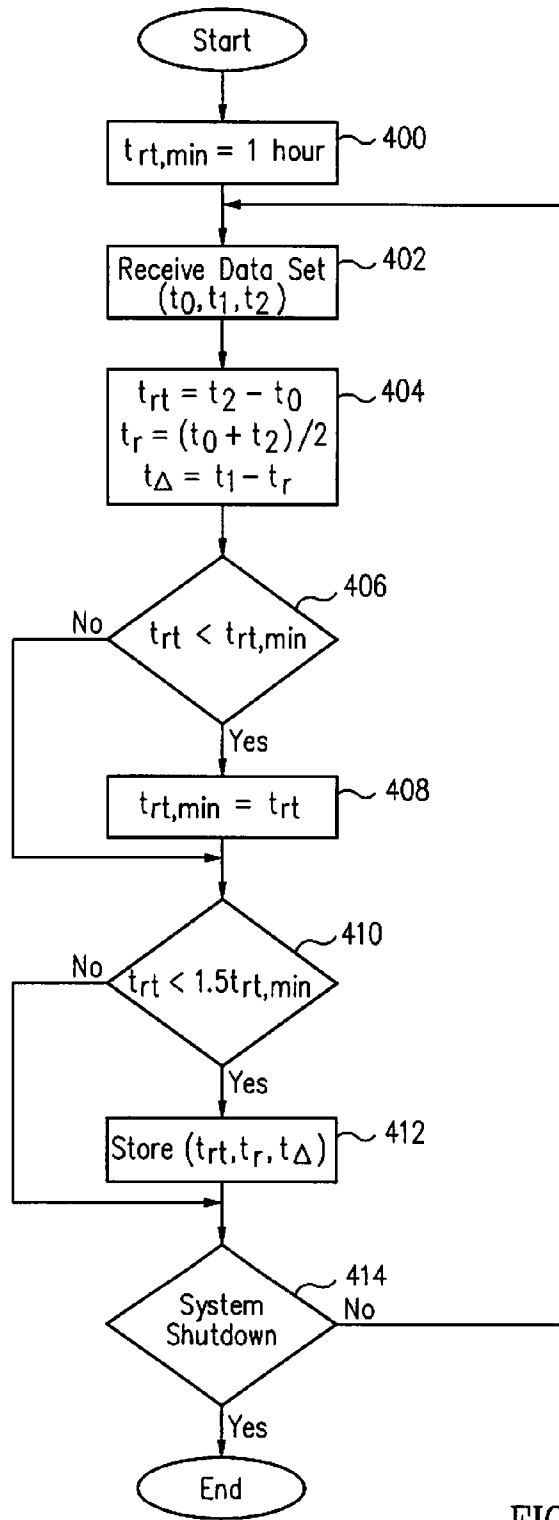


FIG. 4A

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.