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

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

(56) **References Cited**

U.S. PATENT DOCUMENTS

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|                   |         |                  |            |
|-------------------|---------|------------------|------------|
| 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    |

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(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.

\* cited by examiner

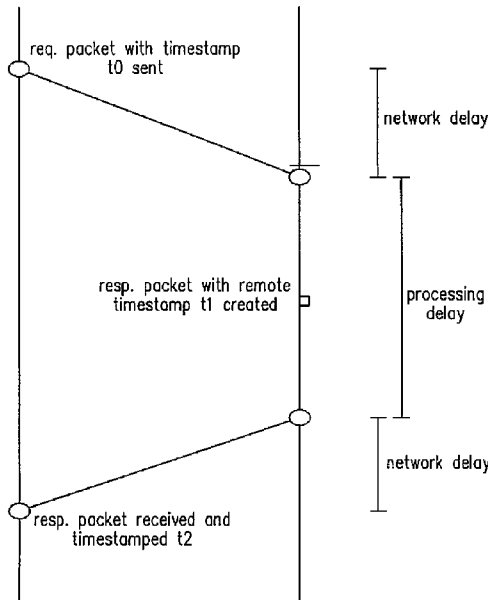
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(57) **ABSTRACT**

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

**19 Claims, 9 Drawing Sheets**



**MICROSOFT CORP.**  
**EXHIBIT 1024**

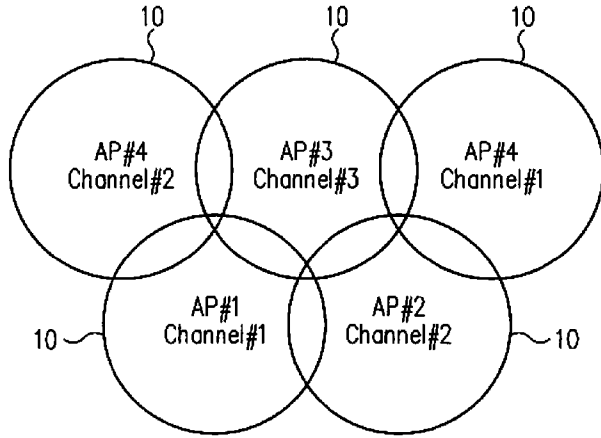


FIG. 1A

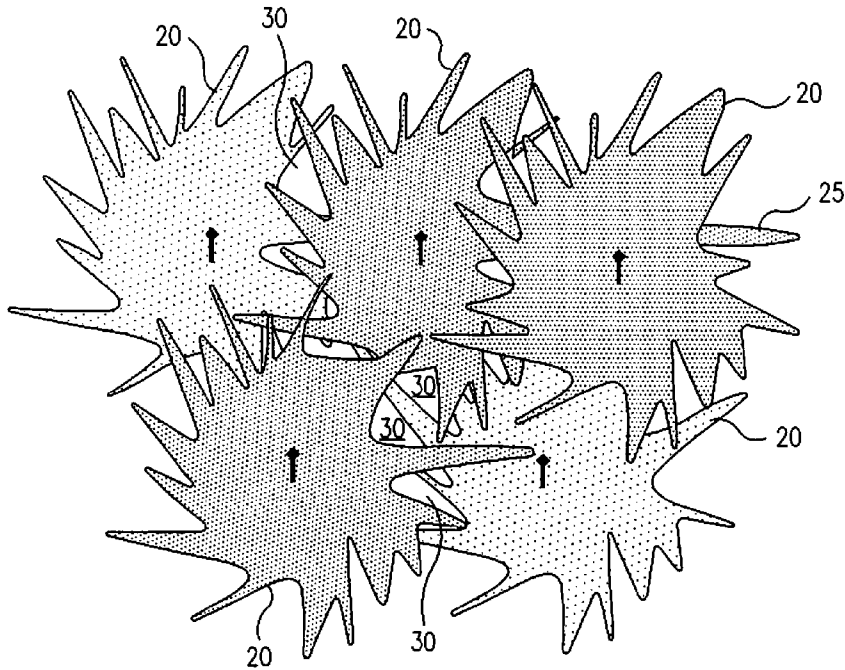


FIG. 1B

PRIOR ART

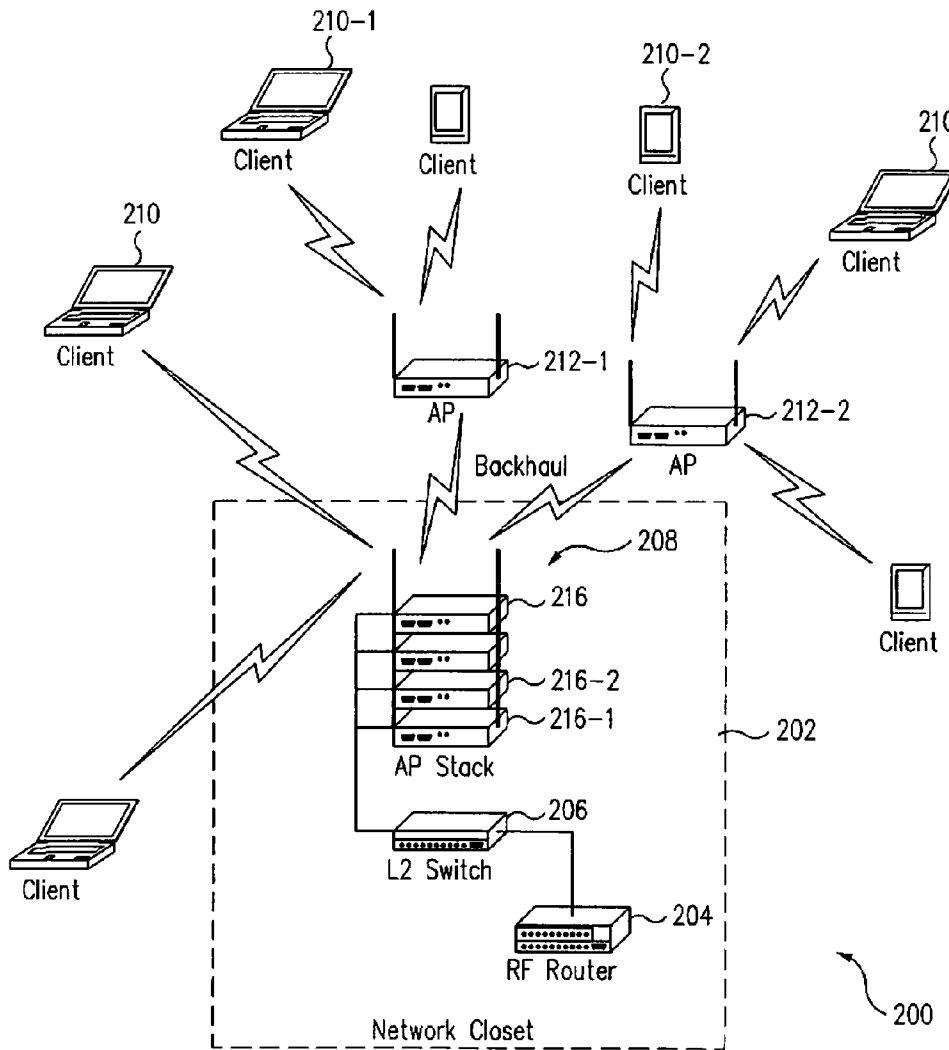


FIG. 2

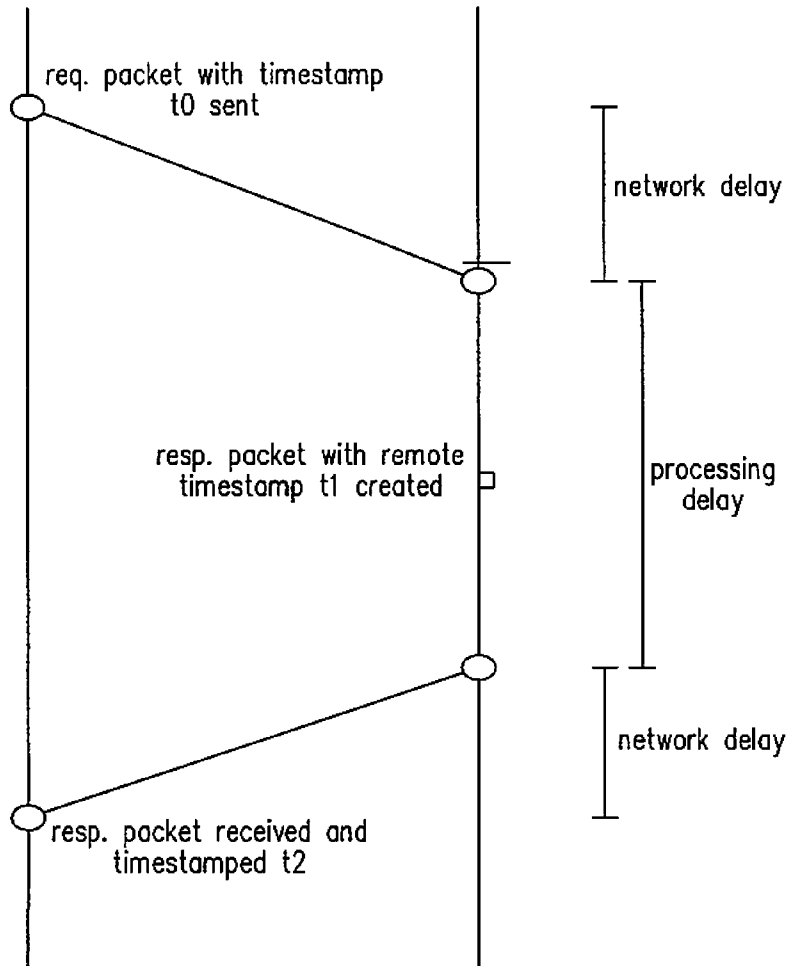


FIG. 3

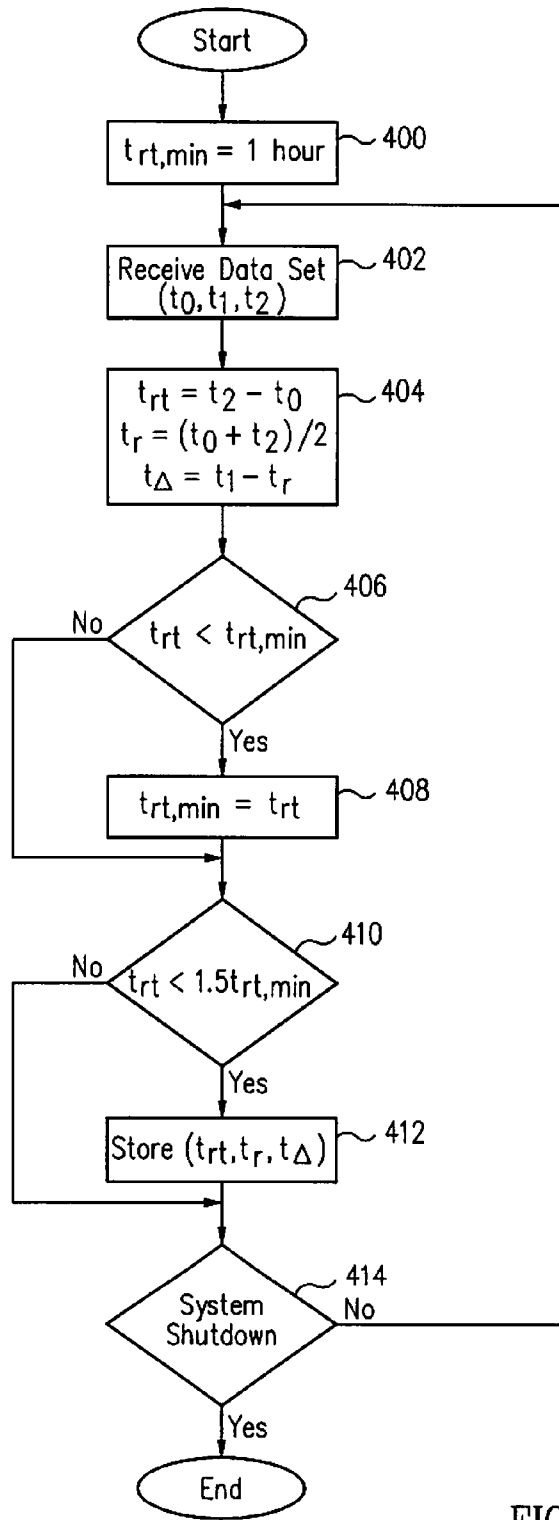


FIG. 4A

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