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# (12) United States Patent

#### Padmanabhan et al.

#### (54) SYSTEM AND METHOD FOR DETERMINING THE GEOGRAPHIC LOCATION OF INTERNET HOSTS

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- (51) Int. Cl. *G06F 15/173* (2006.01) *G06F 15/16* (2006.01)
- (52) U.S. Cl. ...... 709/238; 709/239; 709/241
- (58) **Field of Classification Search** ...... None See application file for complete search history.

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#### (45) **Date of Patent:** Nov. 13, 2007

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#### (57) ABSTRACT

A system and methodologies are disclosed for determining the geographic location of an Internet host. A first method infers host location based on the DNS names of the host of interest or other nearby network nodes. A second method employs network delay measurements from geographically distributed locations to triangulate the coordinates of the host. A third method couples partial host-to-location mapping information obtained from one or more sources with BGP or other routing information in order to infer location of the host of interest.

#### 41 Claims, 13 Drawing Sheets



Error Distance Dispersion 4500 4000 232 3500 Distance (kilometers) 235 3000 2500 2000 1500 wm 1000 236 500 0 20 40 60 80 100 120 140 0 234 IP address sequence number (1000s)

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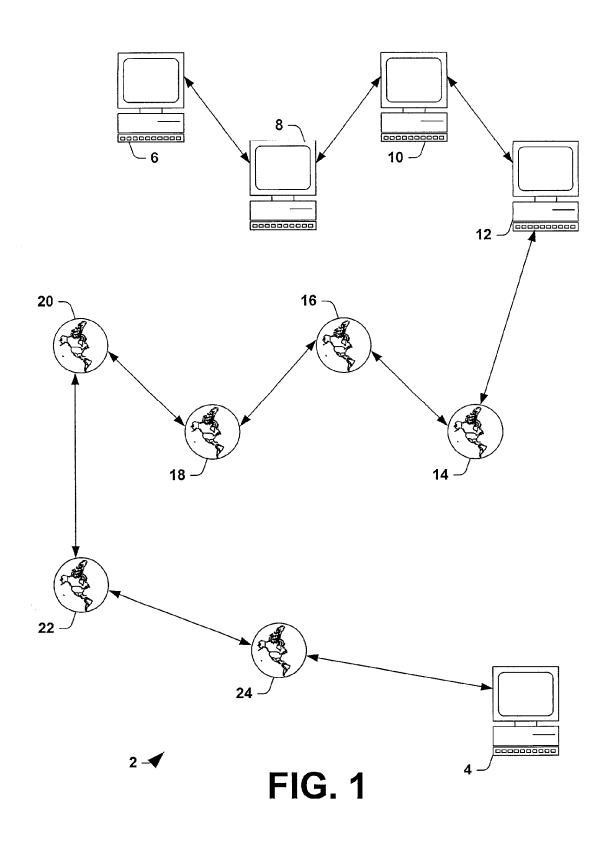
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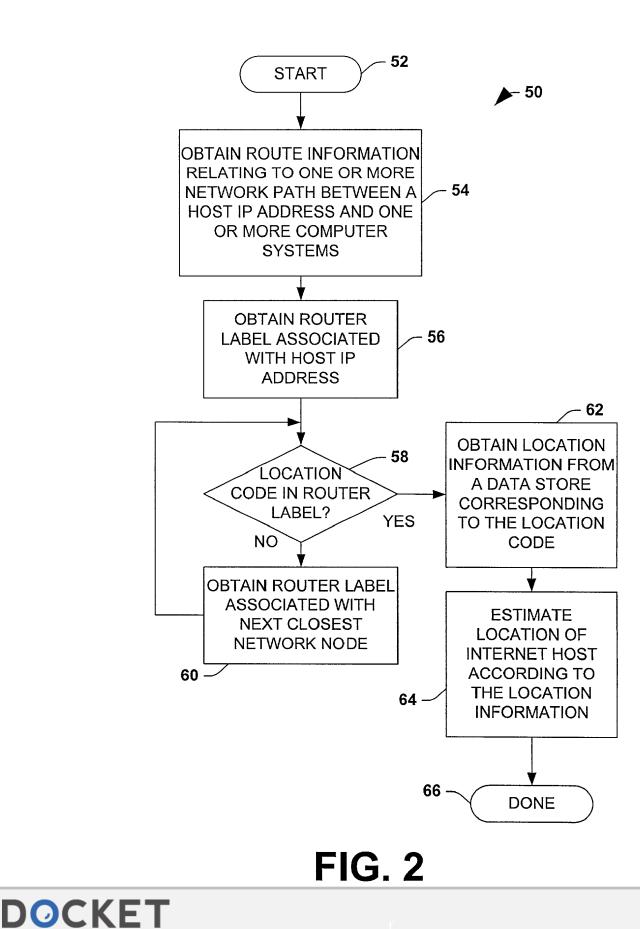
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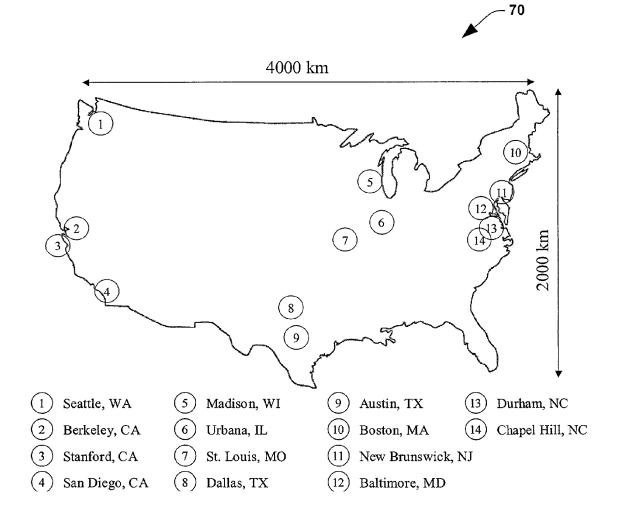
Δ

RM



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# FIG. 3

**R M** Find authenticated court documents without watermarks at <u>docketalarm.com</u>.

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