US005970059A

United States Patent [19]

Ahopelto et al.

[11] Patent Number: 5,970,059

[45] Date of Patent: Oct. 19, 1999

[54] **PACKET RADIO SYSTEM AND METHODS FOR A PROTOCOL-INDEPENDENT ROUTING OF A DATA PACKET IN PACKET RADIO NETWORKS**

[75] Inventors: **Juha-Pekka Ahopelto**, Helsinki; **Hannu Kari**, Veikkola, both of Finland

[73] Assignee: **Nokia Telecommunications Oy**, Espoo, Finland

[21] Appl. No.: **08/875,464**

[22] PCT Filed: **Jan. 8, 1996**

[86] PCT No.: **PCT/FI96/00019**

§ 371 Date: **Jul. 9, 1997**

§ 102(e) Date: **Jul. 9, 1997**

[87] PCT Pub. No.: **WO96/21983**

PCT Pub. Date: **Jul. 18, 1997**

[30] **Foreign Application Priority Data**

Jan. 10, 1995 [FI] Finland 950116

[51] **Int. Cl.**[6] **H04J 3/16**

[52] **U.S. Cl.** **370/338**; 370/401

[58] **Field of Search** 370/389, 401, 370/402, 403, 404, 464, 465, 466, 503, 350, 338, 310, 312, 352, 392, 397, 351, 353; 379/90.01, 93.01, 93.33, 88.13, 88.2, 88.24, 142, 210, 211, 214; 455/403, 432, 517, 516, 524, 525

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,755,992	7/1988	Albal	370/389
5,251,205	10/1993	Callon et al.	370/401
5,313,465	5/1994	Perlman et al.	370/401
5,325,362	6/1994	Aziz	379/60
5,590,133	12/1996	Billstrom et al.	370/349
5,717,689	2/1998	Ayanoglu	370/471
5,793,762	8/1998	Panners et al.	370/389

FOREIGN PATENT DOCUMENTS

522 773	1/1993	European Pat. Off. .
692 897	1/1996	European Pat. Off. .

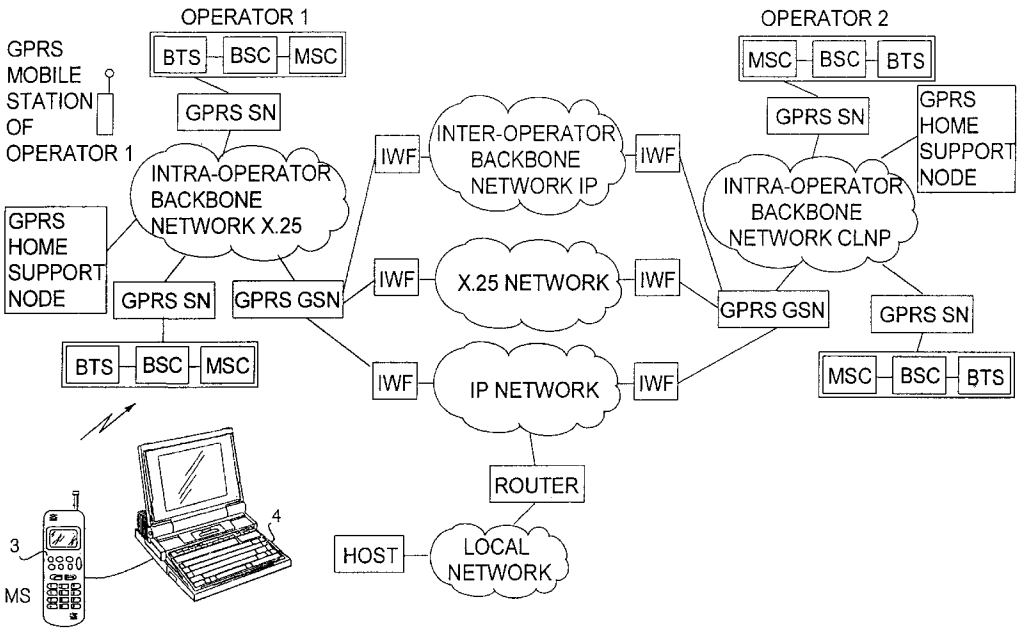
Primary Examiner—Dang Ton

Attorney, Agent, or Firm—Pillsbury, Madison & Sutro, LLP

[57] **ABSTRACT**

The present invention relates to a protocol-independent routing of data packets between a mobile station of a packet radio network and a party(Host) connected to an external network. In the invention, a data packet of an extraneous protocol(IPX) is transferred through a packet radio network using a second protocol as encapsulated in a data packet according to the second protocol. The transferring packet radio network does not thus need to understand the protocol of the transferred extraneous data packet or to be able to interpret the content of the data packet. A data packet network is connected to other packet radio networks, data networks or the backbone network between packet data networks via a gateway node(GPRS GSN), which uses the network-internal protocol towards the dedicated packet network and the protocol of each network towards other networks. When a data packet is transferred via a gateway node from a network into another network, the data packet is encapsulated in a packet according to the protocol of the new network. When the encapsulated data packet arrives in a node which supports the protocol of the encapsulated data packet, the encapsulation is stripped away and the data packet is routed forward according to the protocol of the data packet.

11 Claims, 13 Drawing Sheets



DOCKET ALARM

Find authenticated court documents without watermarks at docketalarm.com.

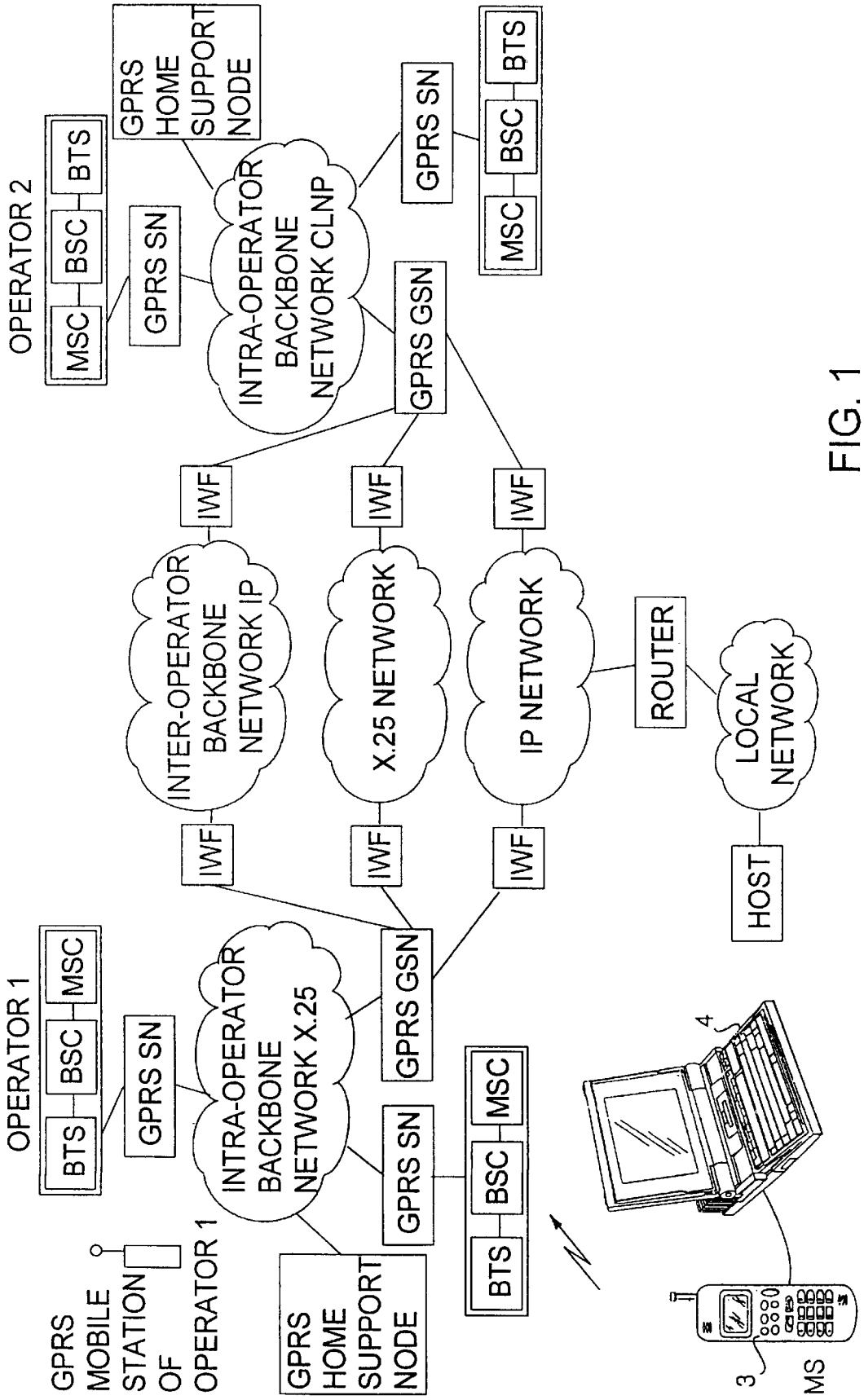


FIG. 1

DOCKET ALARM Find authenticated court documents without watermarks at docketalarm.com.

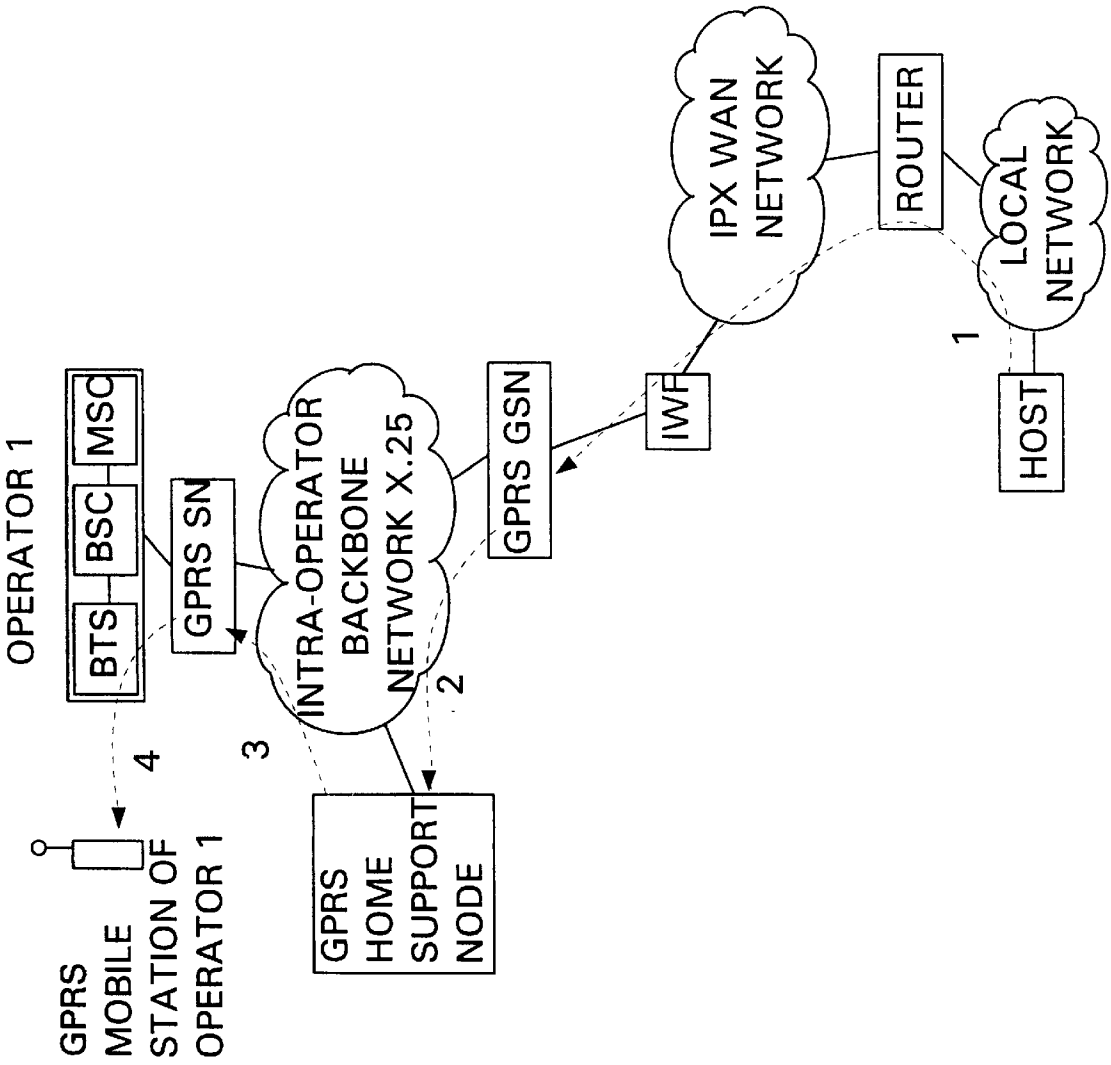


FIG. 2

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

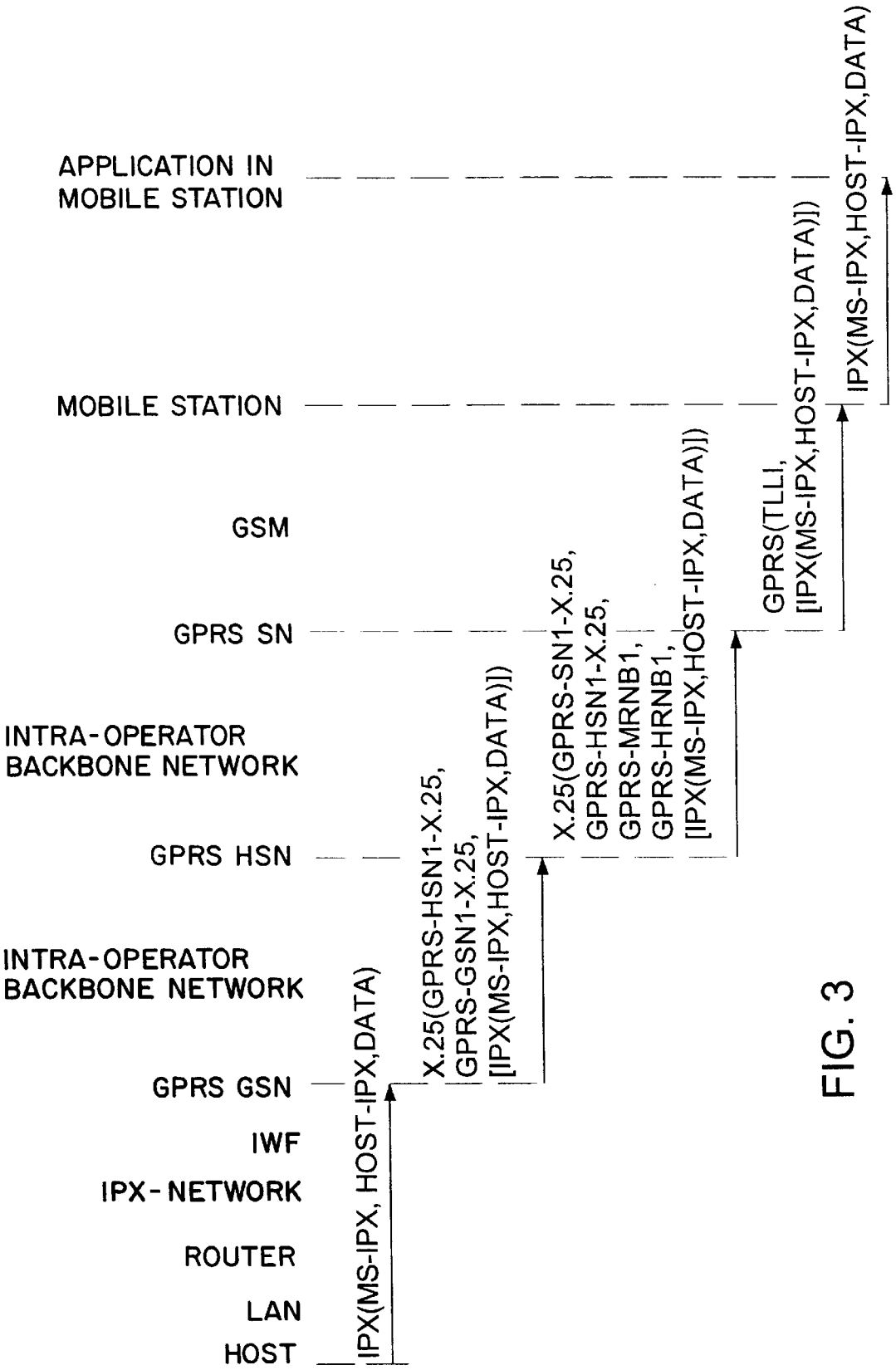


FIG. 3

DOCKET ALARM Find authenticated court documents without watermarks at docketalarm.com.

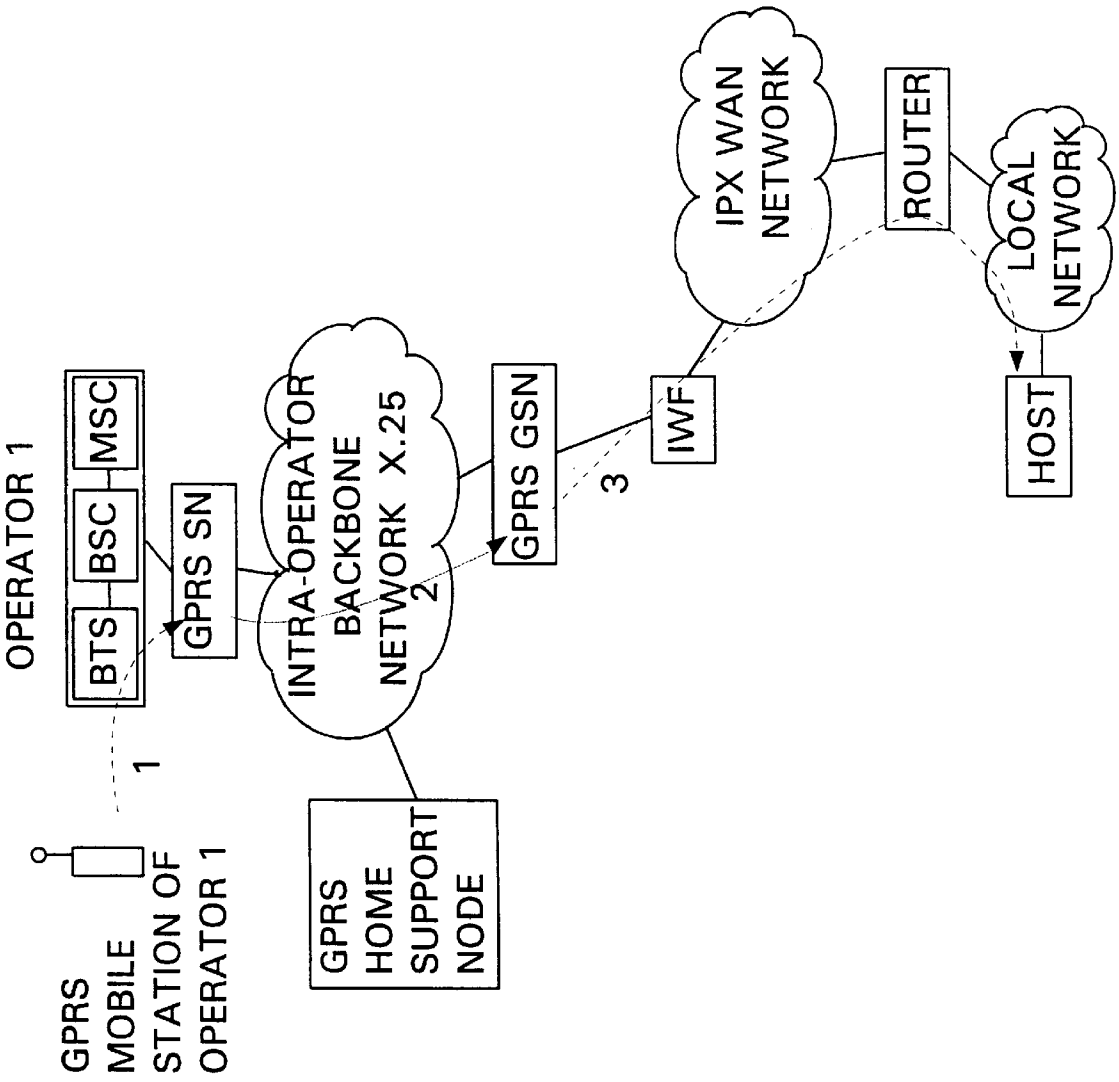


FIG. 4

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

DOCKET ALARM

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.