

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

**(10) Patent No.: US 6,333,931 B1**  
**(45) Date of Patent: \*Dec. 25, 2001**

**(54) METHOD AND APPARATUS FOR INTERCONNECTING A CIRCUIT-SWITCHED TELEPHONY NETWORK AND A PACKET-SWITCHED DATA NETWORK, AND APPLICATIONS THEREOF**

**(75) Inventors:** David C. LaPier, New Providence, NJ (US); David R. Oran, Acton, MA (US); Clay H. Neighbors, Reston; Khaled A. Gouda, Herndon, both of VA (US); Andrew Adamian, Potomac, MD (US)

**(73) Assignee:** Cisco Technology, Inc., San Jose, CA (US)

**(\*) Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

**(21) Appl. No.: 09/221,912**

**(22) Filed: Dec. 28, 1998**

**(51) Int. Cl.<sup>7</sup> ..... H04Q 11/00**

**(52) U.S. Cl. .... 370/385; 370/410; 370/352**

**(58) Field of Search ..... 370/352-563, 370/385, 466, 467, 410, 522; 379/88.17, 202, 201.01-201.05, 201.11, 201.12, 202.01, 203.01; 348/14**

**(56) References Cited**

**U.S. PATENT DOCUMENTS**

5,793,771 \* 8/2000 Darland et al. .... 370/467

5,828,666	*	10/1998	Focsaneau et al. ....	370/389
5,862,339	*	1/1999	Bonnaure et al. ....	709/227
5,898,839	*	4/1999	Berteau .....	709/227
5,933,490	*	8/1999	White et al. ....	379/221
5,987,118	*	11/1999	Dickerman et al. ....	379/264
6,021,126	*	10/1998	White et al. ....	370/352
6,084,892	*	7/2000	Benash et al. ....	370/701
6,111,893	*	8/2000	Volsun et al. ....	370/466
6,112,305	*	8/2000	Danes et al. ....	713/156

\* cited by examiner

*Primary Examiner*—Chau Nguyen

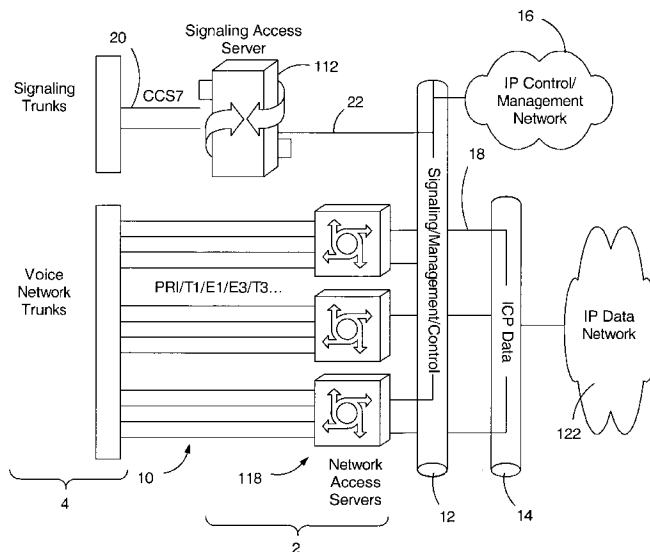
*Assistant Examiner*—Jasper Kwoh

**(74) Attorney, Agent, or Firm**—Hickman Palermo Truong & Becker LLP; Christopher J. Palermo

**(57) ABSTRACT**

A method and apparatus are disclosed for interconnecting a circuit-switched telephone network and a packet-switched data network for communication among them. A signaling trunk of a circuit-switched telephone network is coupled to a signaling access server that is also coupled to a signaling, management and control network. One or more voice trunks of the telephone network are coupled to one or more network access servers, which are also coupled to the control network to thereby receive instructions from the signaling access server. The network access servers are also coupled to a packet-switched data network, such as the global packet-switched network known as Internet. The signaling access server can receive call setup messages and other messages in standard telephone network protocol formats and convert them into call setup messages in a special protocol for communications between the signaling access server and the network access servers. The signaling access server can instruct the network access servers to establish a call, containing voiceband information such as modem-based data calls, from the voice trunks to the data network. Accordingly, the public switched telephone network and the Internet may be interconnected and may inter-communicate without modifying the protocols of either one.

**19 Claims, 23 Drawing Sheets**



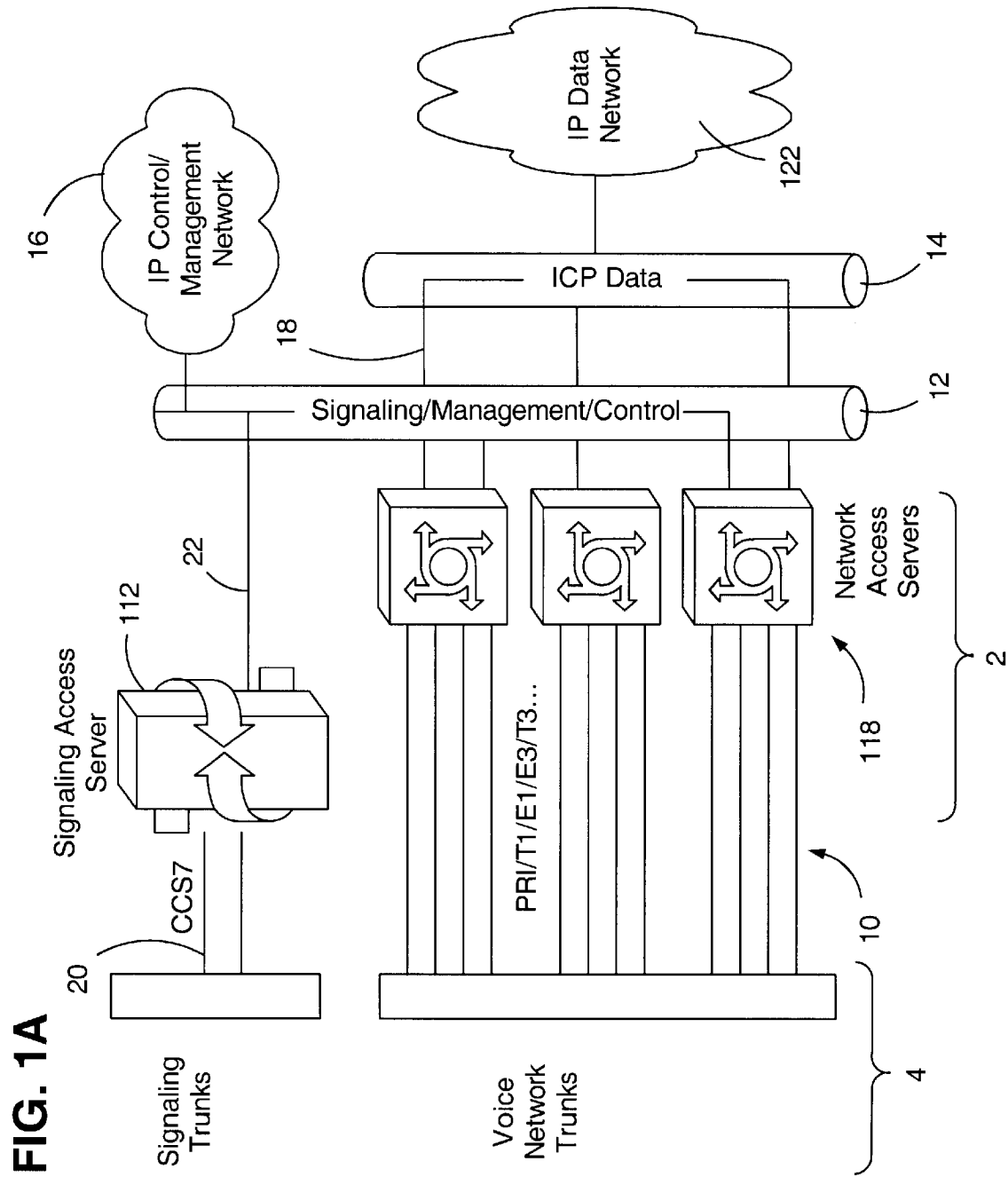


FIG. 1A

FIG. 1B

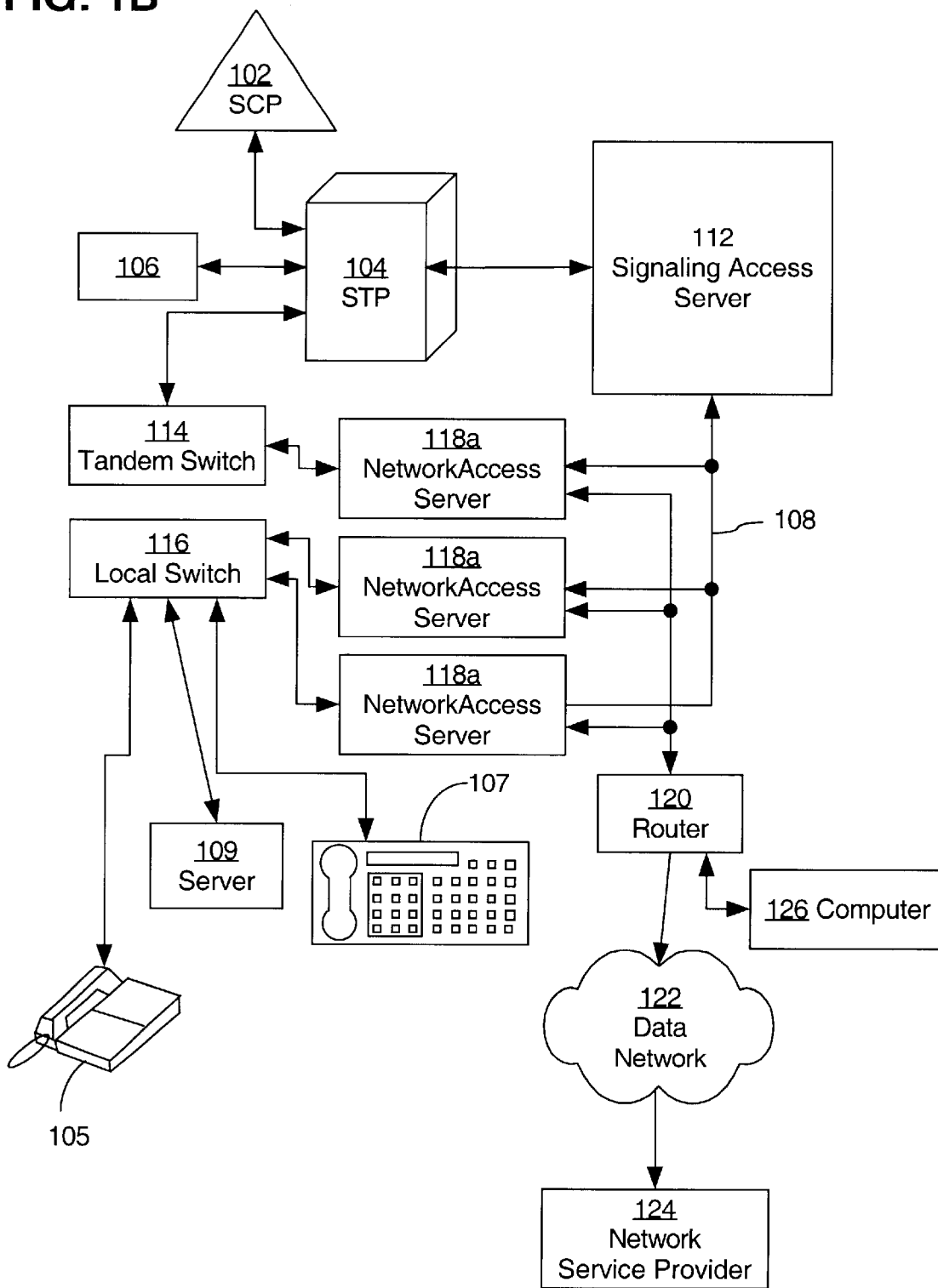
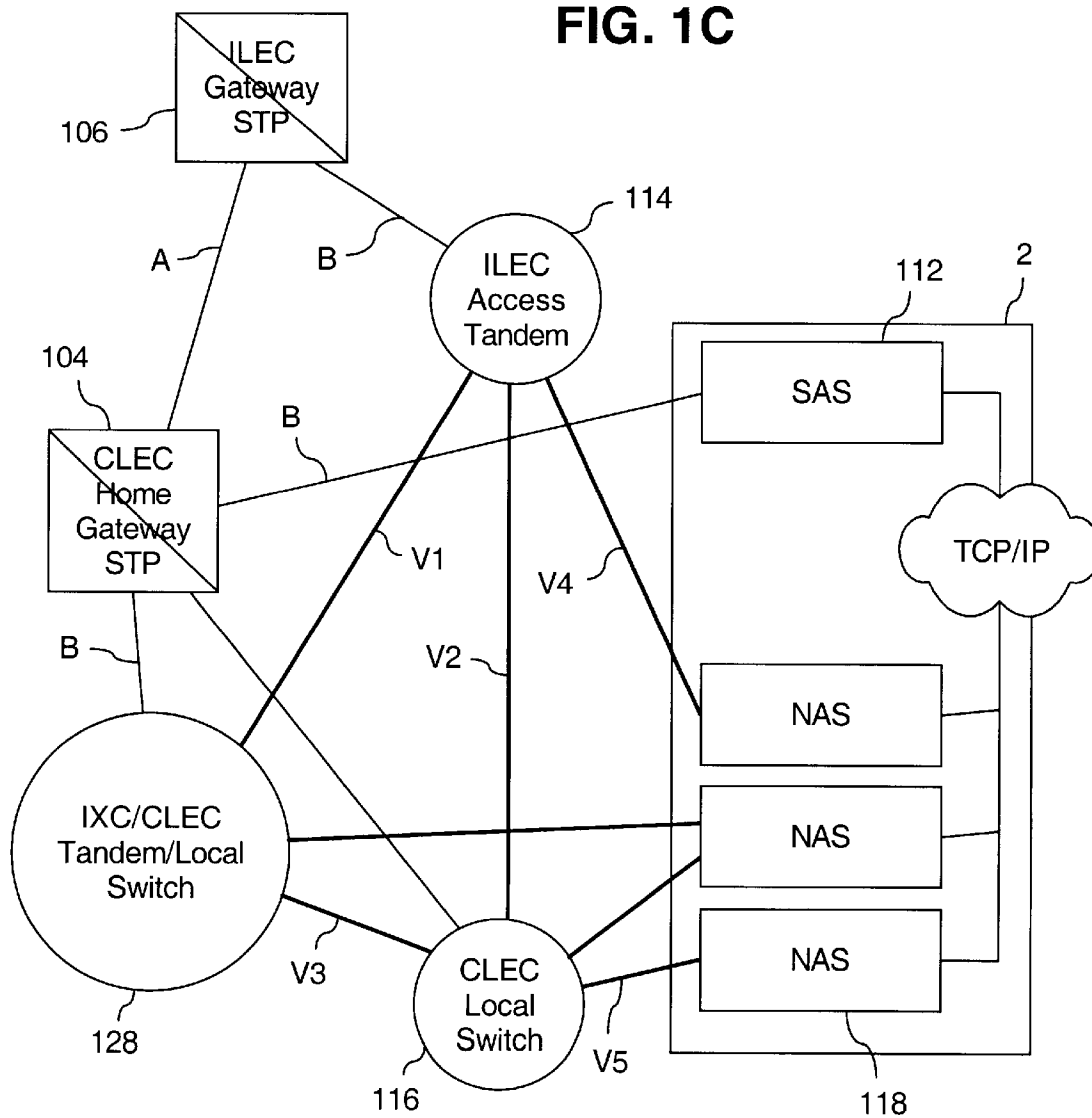


FIG. 1C



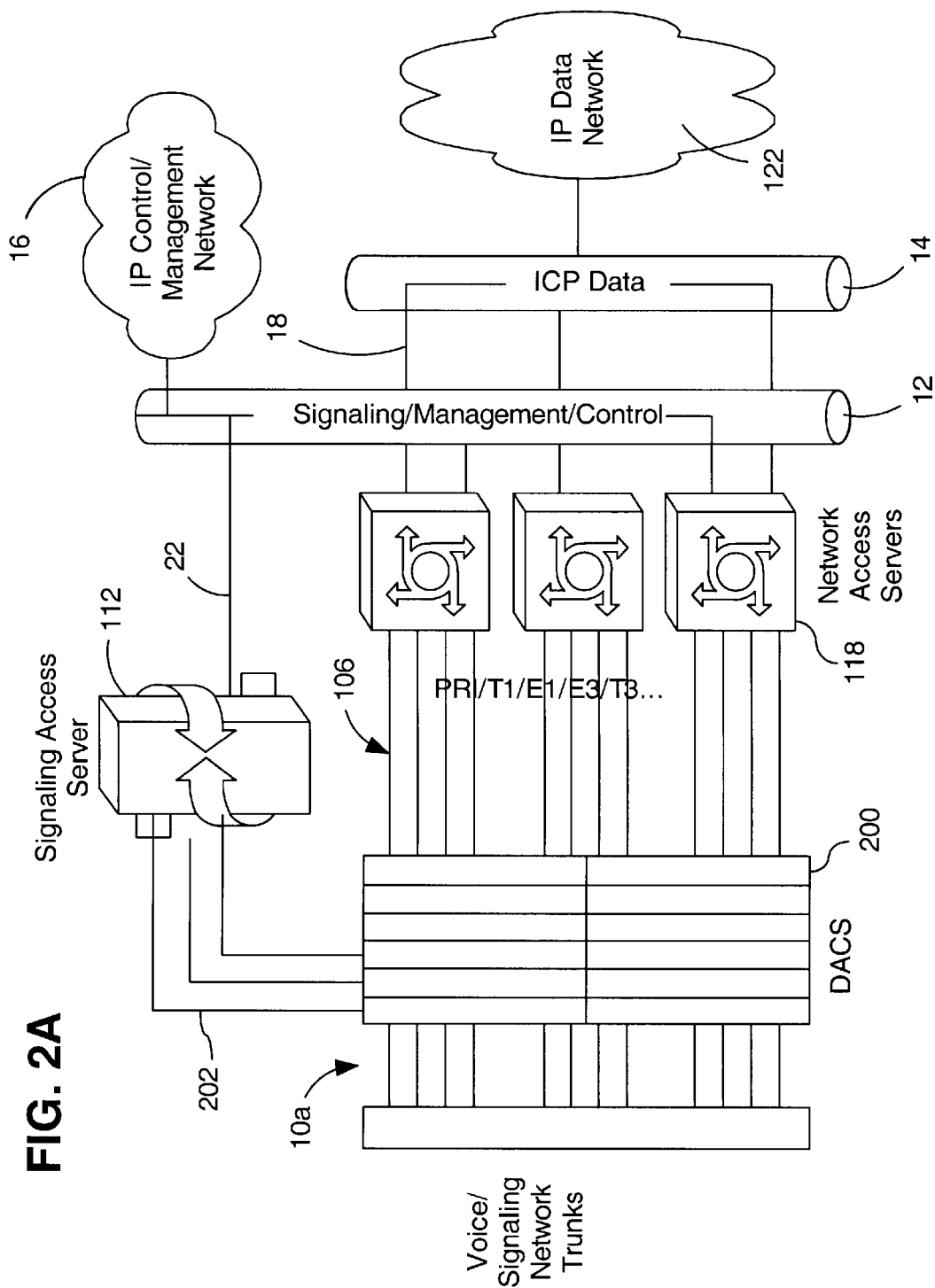


FIG. 2A

# 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.