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**Chu et al.**

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(54) **METHOD AND APPARATUS FOR ESTABLISHMENT AND MANAGEMENT OF VOICE-OVER IP VIRTUAL PRIVATE NETWORKS IN IP-BASED COMMUNICATION SYSTEMS**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 976 days.

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(51) **Int. Cl.**  
**H04L 12/56** (2006.01)  
**H04J 1/16** (2006.01)

(52) **U.S. Cl.** ..... **370/401**; 370/352; 379/88.17

(58) **Field of Classification Search** ..... 370/352-356, 370/400, 401, 466, 467, 230, 389, 392; 709/231; 379/88.17

See application file for complete search history.

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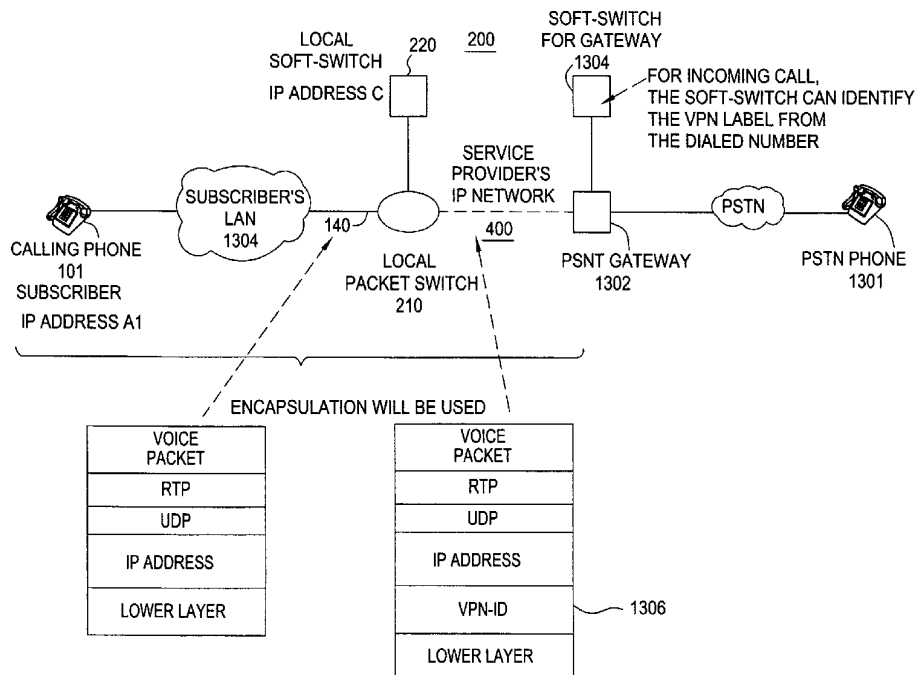
\* cited by examiner

Primary Examiner—John Pezzlo

(57) **ABSTRACT**

Establishing voice calls in an IP based VPN includes determining the relative location of a terminating point with respect to an originating point of a new communication containing the voice data, determining one or more IP addresses to egress the communication from the originating point to the terminating point, creating a VPN identifier in the new communication, passing the new communication to the terminating point and removing the VPN identifier from the new communication. The VPN identifier can be an extra field added to an encapsulation coding scheme of the voice data.

**16 Claims, 16 Drawing Sheets**



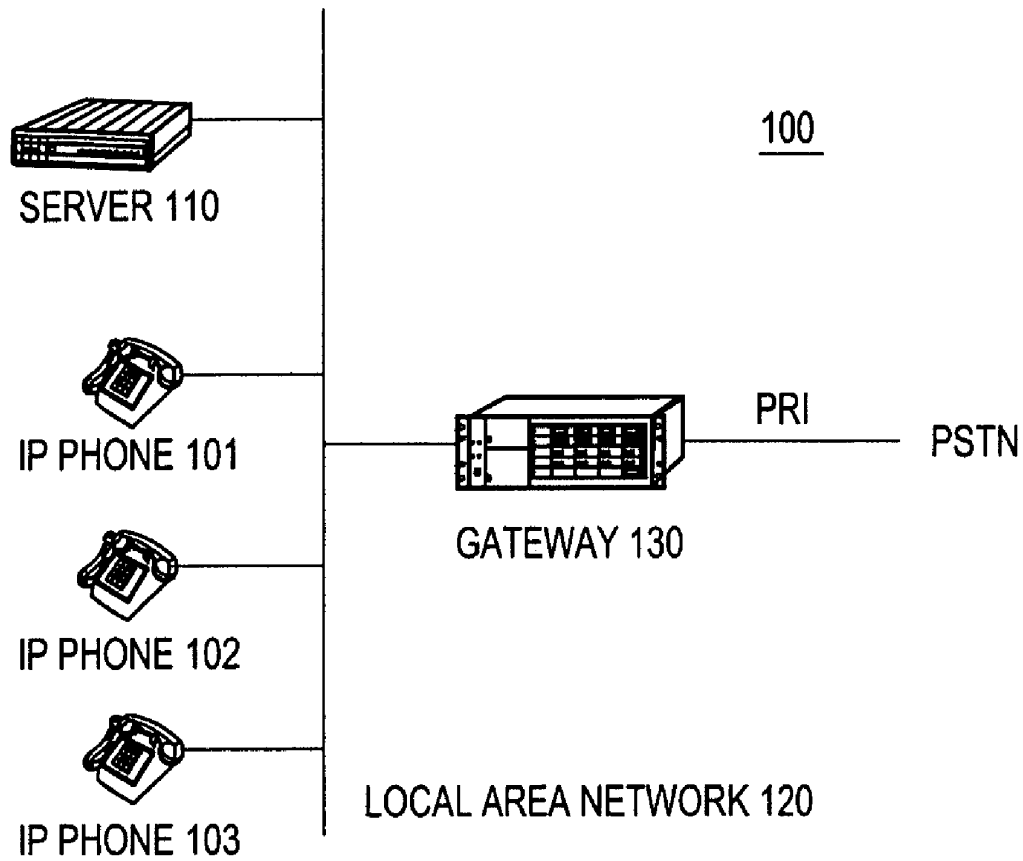


FIG. 1  
(PRIOR ART)

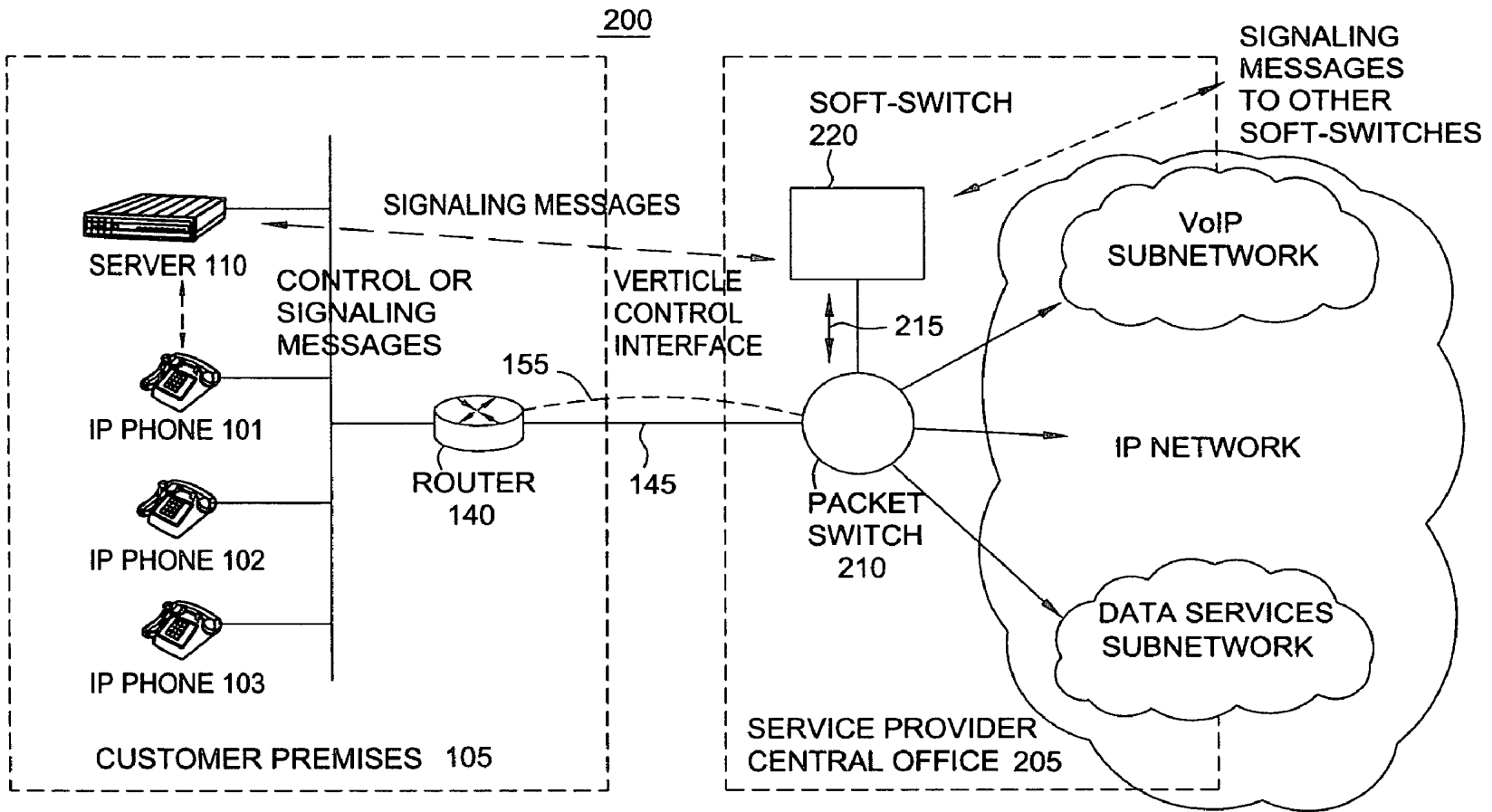


FIG. 2

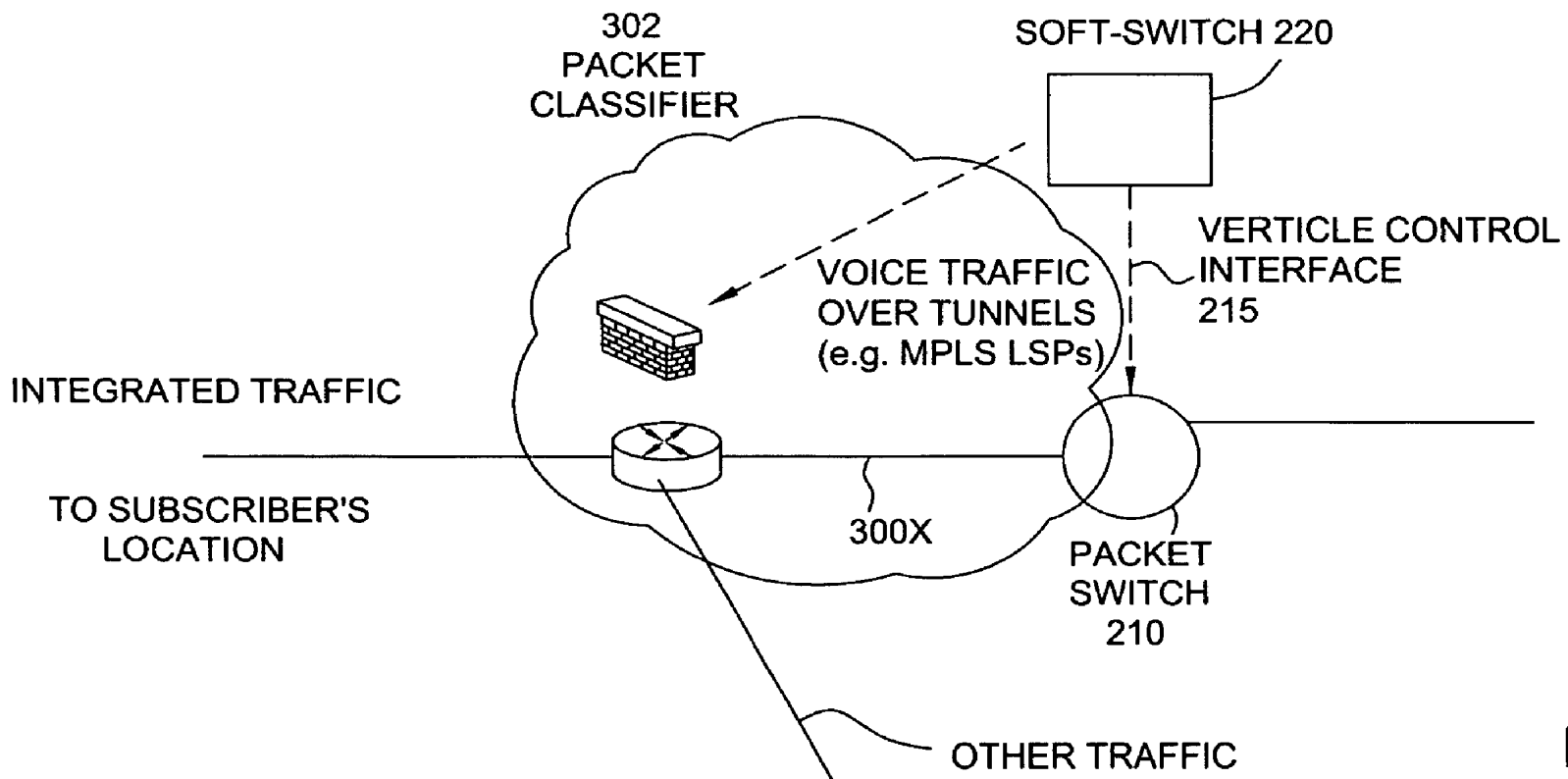


FIG. 3

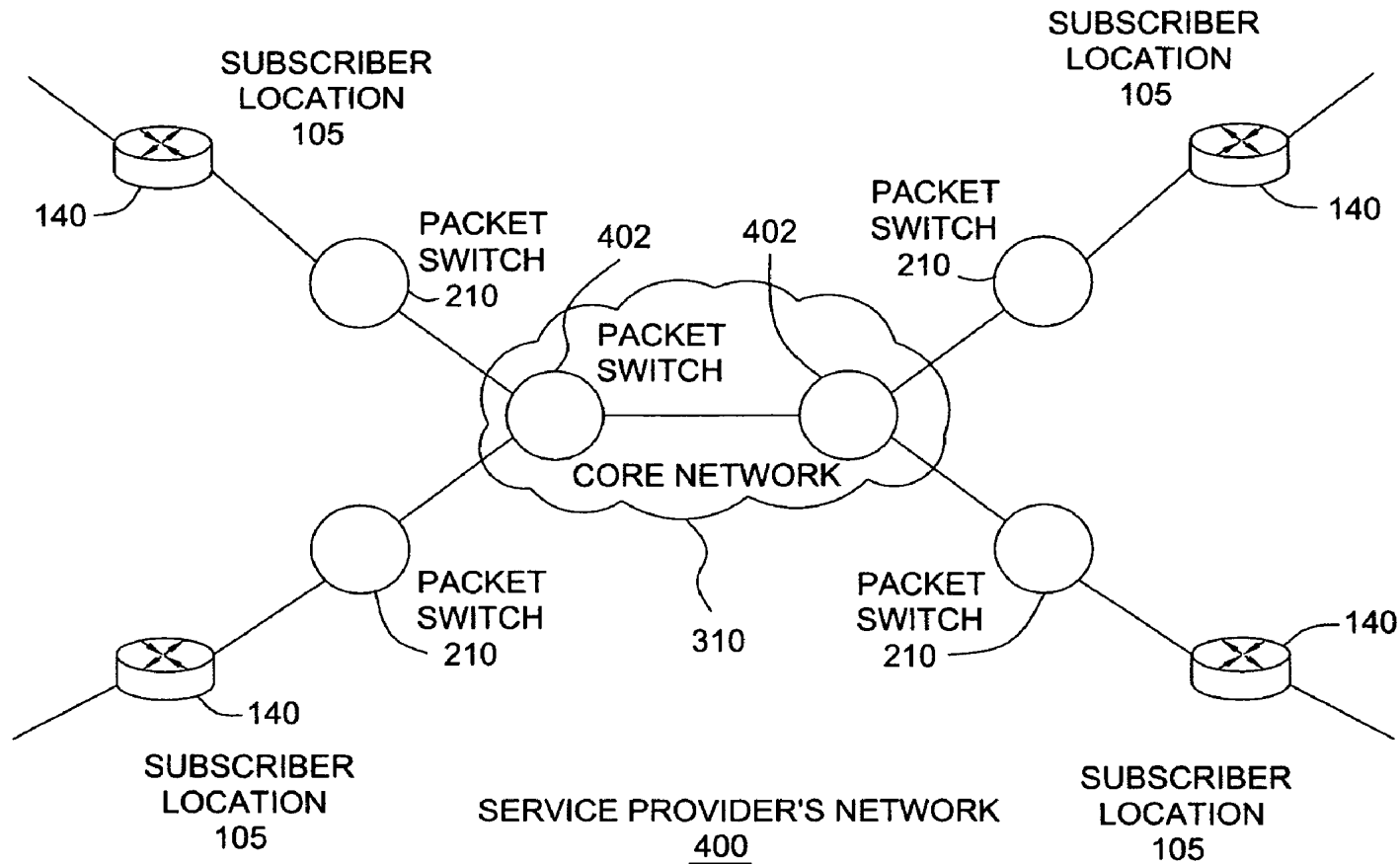


FIG. 4

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