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(54) **TRAFFIC MANAGEMENT FOR FRAME RELAY SWITCHED DATA SERVICE**

(75) Inventors: **Christopher J. Chase**, Freehold; **Stephen L. Holmgren**, Little Silver; **John Babu Medamana**, Colts Neck; **Vikram R. Saksena**, Freehold, all of NJ (US)

(73) Assignee: **AT&T Corp**, New York, NY (US)

(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

(21) Appl. No.: **08/988,424**

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(Under 37 CFR 1.47)

Related U.S. Application Data

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(51) **Int. Cl.^{7}** **H04L 12/28**
(52) **U.S. Cl.** **370/232**; 370/253; 370/254
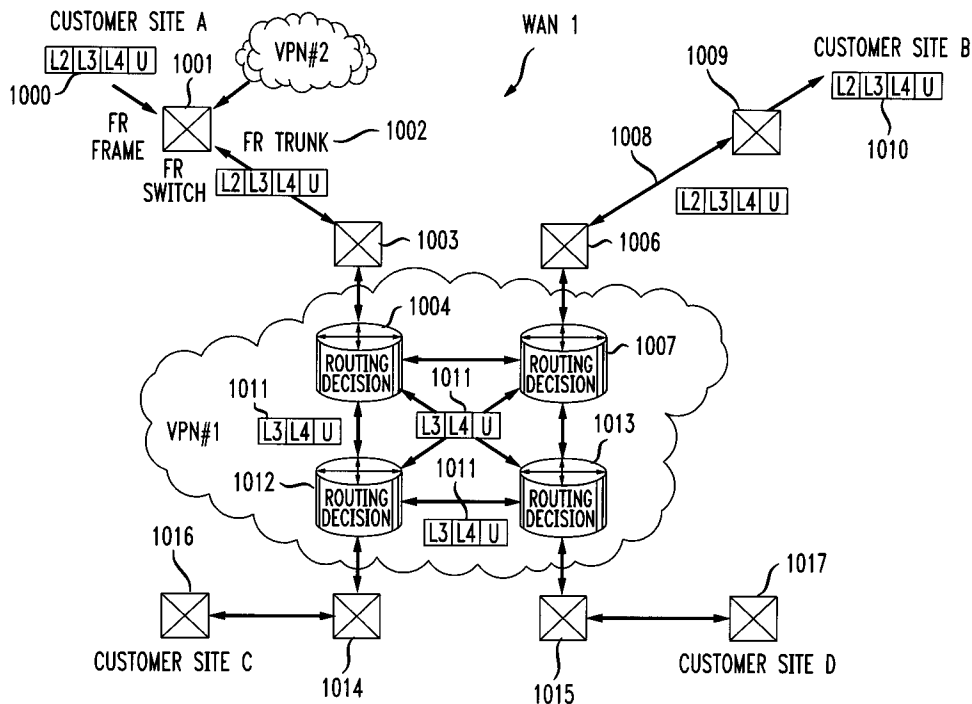(58) **Field of Search** 370/412, 414, 370/416, 468, 236, 232, 253, 395, 429, 234, 235, 254

(56) **References Cited**

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Primary Examiner—Chi H Pham
Assistant Examiner—Brenda H. Pham

(57) **ABSTRACT**

A new type of data transport service which uses a frame relay layer 2 data link connection identifier (DLCI) to select among various service types, feature sets, and/or closed user groups (CUGs). A layer 3 address may be extracted from a layer 2 frame, and the layer 3 address information may be used to route a data packet over a packet-switched network according to the service classes, feature sets, and/or CUGs selected. At the destination, the layer 3 data packet may again be enclosed in a layer 2 frame with a DLCI indicating the service classes, features sets, and/or CUGs. Because the use of conventional permanent virtual circuits (PVCs) is not required in aspects of the invention, new methods of measuring and managing network traffic are presented.

31 Claims, 10 Drawing Sheets

FIG. 1

FIG. 2

FIG. 3

ISO PROTOCOL LAYER-#

DATA/INFORMATION   TCP HEADER | USER DATA | APPLICATION LAYER-7

PDU   IP HEADER | H | USER DATA | TRANSPORT LAYER-4

PACKETS a.k.a.: DATARAM   DATA LINK CONNECTION IDENTIFIER | H | USER DATA | NETWORK LAYER-3

FRAMES (FRAME RELAY) | FLAG | DLCI | USER DATA | FCS | FLAG | DATA LINK LAYER-2

BITS | BITS | BITS | BITS | BITS | BITS | .... | BITS | BITS | BITS | PHYSICAL LAYER-1

FIG. 4

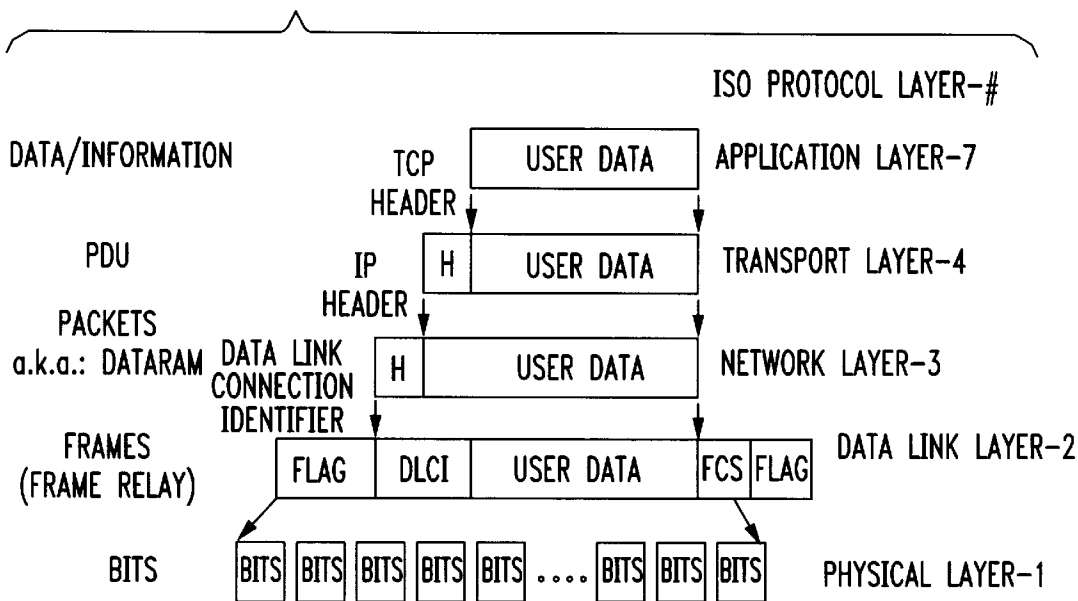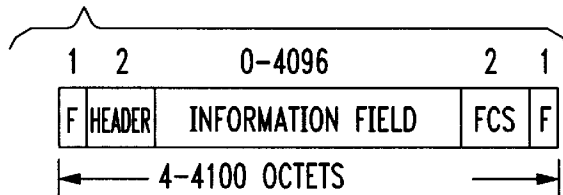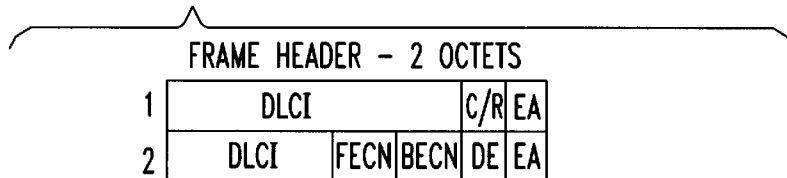| 1	2	0-4096	2	1
F	HEADER	INFORMATION FIELD	FCS	F

|← 4-4100 OCTETS →|
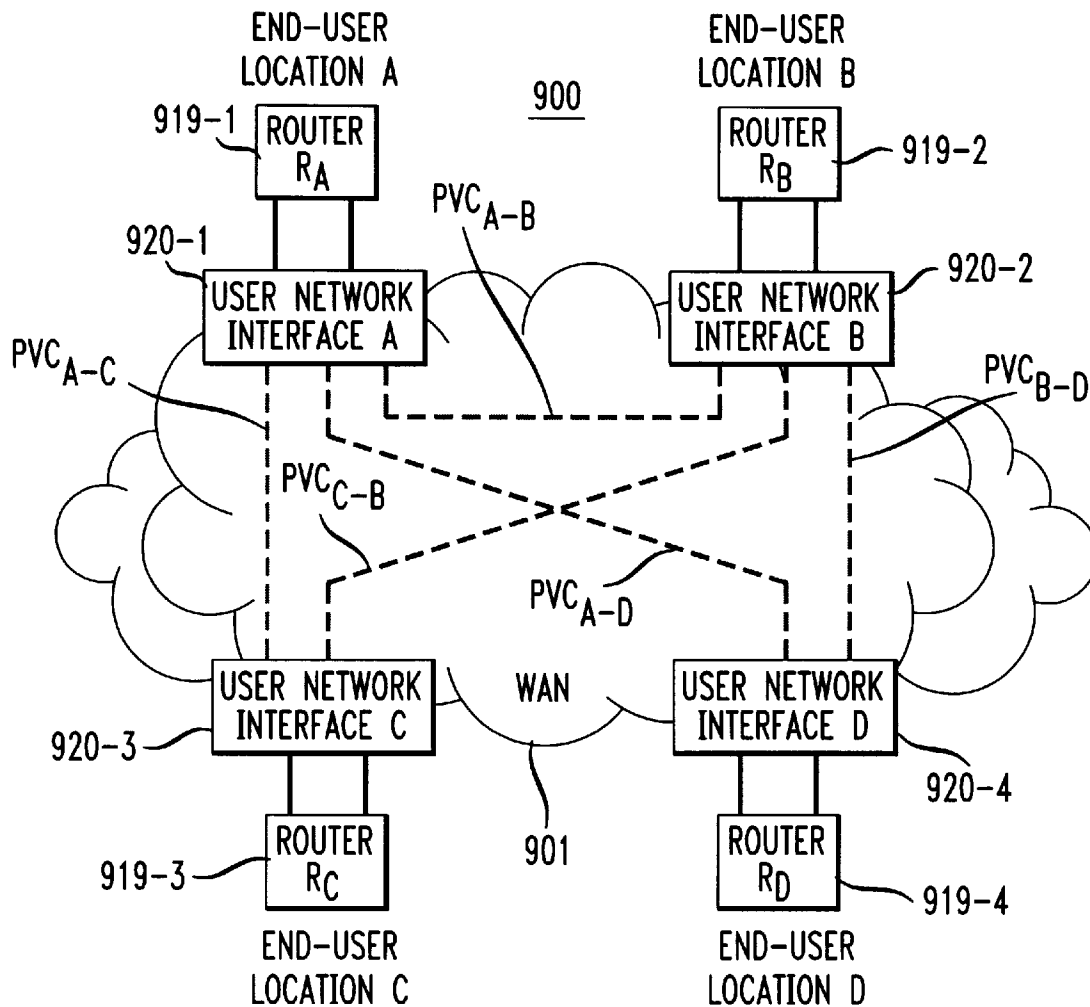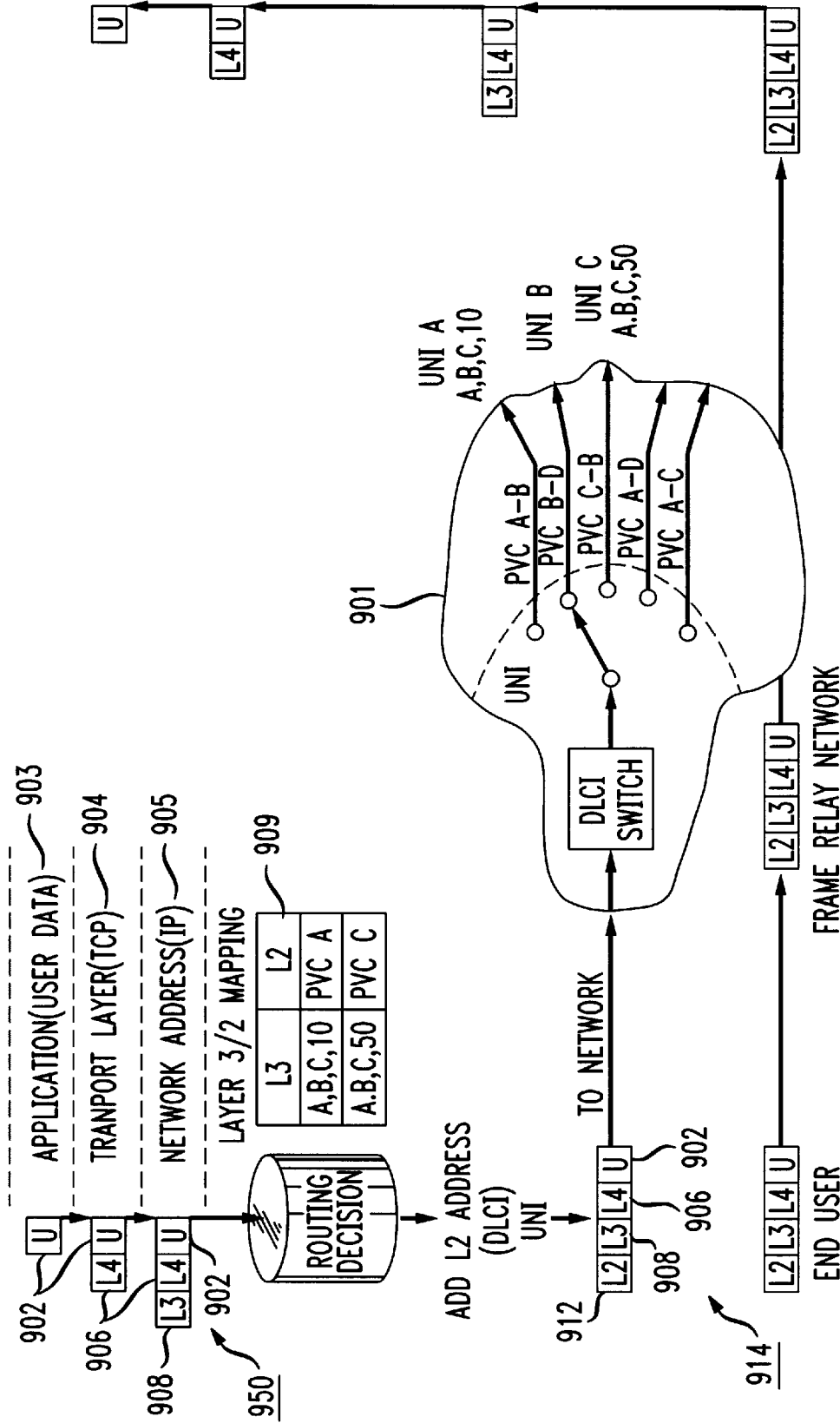
F = FRAME DELIMITER (FLAG)
(01111110 BINARY VALUE)
HEADER = FR HEADER FIELD
INFORMATION FIELD = USER'S PAYLOAD
FCS = FRAME CHECK SEQUENCE

FIG. 5

FRAME HEADER - 2 OCTETS

1	DLCI		C/R	EA
2	DLCI	FECN	BECN	DE	EA

DLCI = DATA LINK CONNECTION IDENTIFIER (10 BITS)
C/R = COMMAND / RESPONSE (1BIT)
EA = EXTENDED ADDRESS (2 BITS)
FECN = FORWARD EXPLICIT CONGESTION NOTIFICATION (1 BIT)
BECN = BACKWARD EXPLICIT CONGESTION NOTIFICATION (1 BIT)
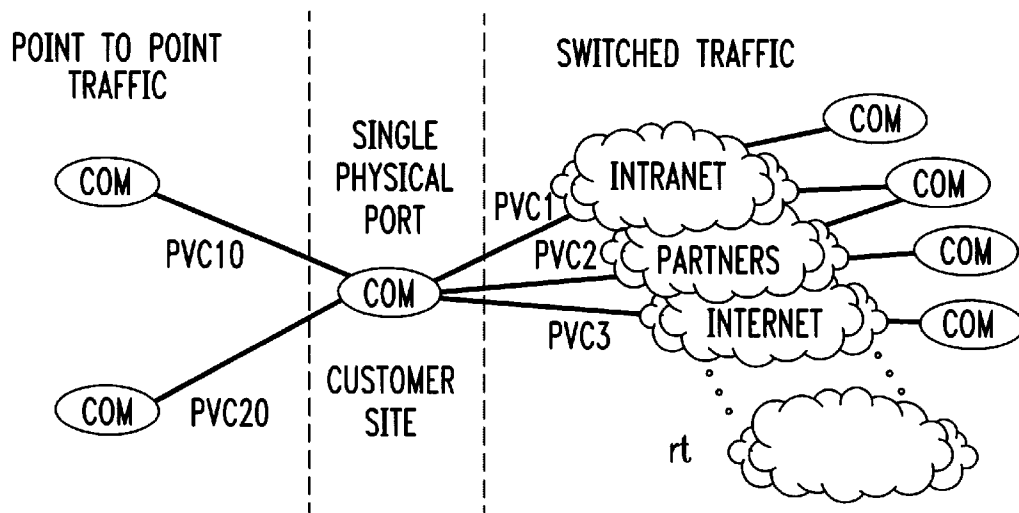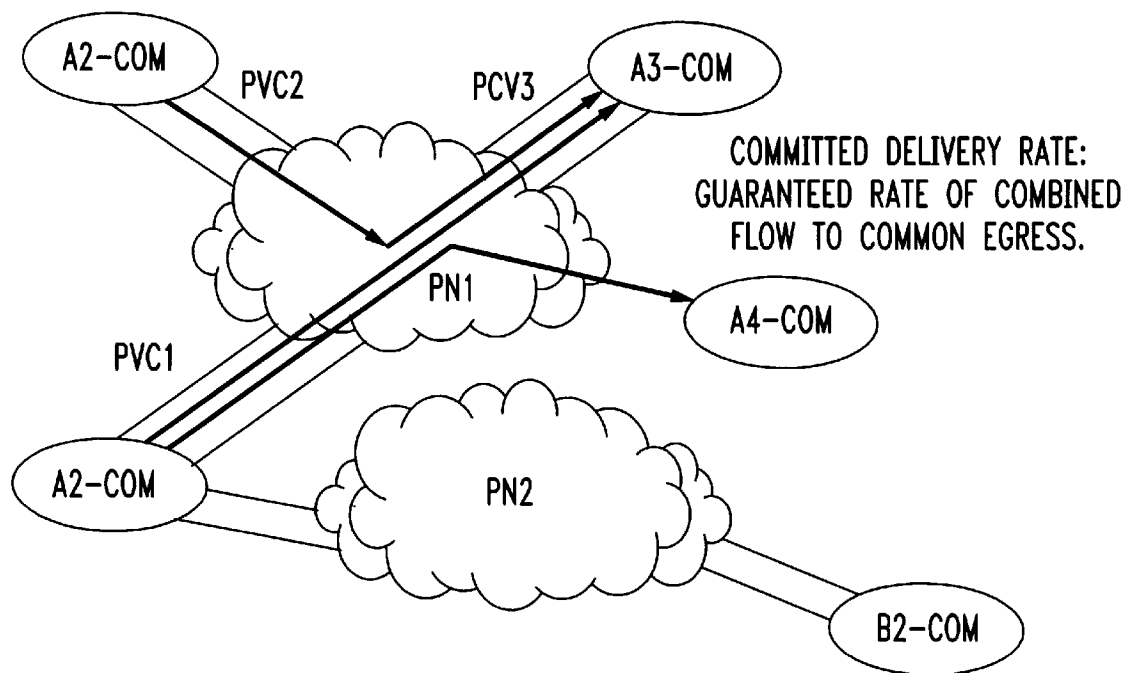DE = DISCARD ELIGIBILITY (1 BIT)

FIG. 6

FIG. 11

DOCKET ALARM

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