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(12) (A)

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H04L 12/28

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(43)

10-2004-0071220
2004 08 11

(21) 10-2004-7009498

(22) 2004 06 18

2004 06 18

(86) PCT/US2002/040513

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WO 2003/053016

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2003 06 26

(30) 10/026,583 2001 12 18 (US)

(71) , 95134-1706, , 170

(72) , 95132, , 3456

, 95132, , 3456

, 95070, 가, 12649

, 95051, , 672

(74)

:

(54)

, IP

TCP

o-buffer

end-to-end
2

buffer-to-buffer
가

가

end-to-end
2

buffer-t
1
가

end-to-end

buffer-to-buffer
1

2

end-to-end

-to-end

Class 2

buffer-to-buffer

end-to-end

end

(quench)

가

1
1

1

2

1

2

2

2

2

1

1

1

2

(end)

2

2

2

1

2

1

2

2

가

1

1

1

2

(queue),

1

2

2

1

1

2

2

1

1

가,

/

1

2

(head-of-line)

3

4

5

6

7

8

9

10

11

12

가

13

14

IP

1
 가
 1 가 (101)
 (111) (121) 가 (103,105) (103)
 111) (121)가 (107) (107) (RAID) (103)
 (103,105) (109) (115), (107), (103) (153),
 (123) (151) (151) (111)
 (109) (111) (105) (103)
 (151)
 , IP 가 ,
 (109) (103,105) (107) (109) (151)
 가 , , (151)
 (109)가 , buffer-to-buffer (107)
 (109) (107) (109) (109)
 (109)가 가 (107) 가 ,
 (107)가 (109) (109)
 (151) 가 (109) (107) (151)
 (153) (115) 가 ,
 buffer-to-buffer (109)
 (107) (109) (115)
 가 (109) 가 , (115) (115) (107)
 (109) buffer-to-buffer (115) (151)
 (151) (111) (113)
 가 buffer-to-buffer
 (113) , , (115)
 (109)가 (107) (109) buffer-to-buffer
 (109) (151) (107)
 (115) (151) (113) (115) (153)

(115)가 (151) , 3 가 (109) (153)

(107)가 (109) , (107) (103,105)
 buffer-to-buffer (103,105) (101) buffer-to-buffer (107)
 (spreading)

2 - - 2 , (211)
 가 (201, 203) (217) (217,219)
 (211,213) , , 가
 (221,223,229) 10 (227) , ,
 (211) (213)가 10 (203) (217
 ,219) (227)가 (203) (203)
 (211) (217) (203) (225) (231)
 (201) (221,223) (223) (235)

3 (203) (225) (231)
 (231) (217) (219) (203)
 (217) (219) (203)
 (203) buffer-to-buffer 가 (203)
 buffer-to-buffer (211) (217) (213)
 (219) (213,219) (213) (219) (225)
 1

buffer-to-buffer

2 가 10 가 1 가

3 buffer-to-buffer 가 (301)
 (301) (351,353,355,357) (301)
 (303) (303) 9351 (353,355,357)
 (303) (353,355,357)

(301)가 (353) (303)
 (301) (303)가 가 (351) 가 (353)
 (351) 가

(303) (311-347)
 (303)

(305) (round-robin)
 (353) (355)
 (305) (311)

(357) , (355) (321) ,
 (331) ,
 가 (VOQ) . VOQ Tamir Y. Frazier G. ' High Performance multi-queue buffers for VLSI communications switches', Proc. Of 15th Ann. Symp. On Comp. Arch., pp 343-354, June 1988

(flow)

가

4 . 4 가

(401) (403)

(411)

(403)

5 , 0 10 가 260 , 112 11 1 ,
 가 6 , 127 ,

X = 512

N =

IF X/16 >= 8, then N=4,

else N= 4+2 (8-(X/16)).

4

50% 80% 가 가 70%
 10% 가 가 10%
 0.01 %

가

가
 가

5 . 501 ,
 . 503 ,

가 513 N 가 509 , 511 N (low) 515

가 4 507 N

가 505 , 4

가 50%

가 4 35% 85 25% 90% 80%

가 6 (high) (607) 가

가 buffer-to buffer 90% (607) (603) 가

가 가 (601)

가 (605) (605) (indicator) 가

(605) 가 가 (605)

, 가 .

. 가 ;

가 .

6 . , 0

가 가 1/2 , 3가 3가

0 (one half) 가 가

가

7 (700) N (700)

(700) (703) (705) (703) A 가 ,
(711) B (713) OX_ID(717) (713),
(715), (721) OX_ID (705)
(711), (hop) (723)

B A (771) A B

(773) (753) (750) (775) (775) (vendor) OX_ID(717) (781) OX_ID(
(777) 1), OX_ID OX_ID(777) OX_ID 가 (773) (775)
(783) 가 (775)

8 가 N . 803 , S D 가
. 805 ,

805 , (high) , D 821 825
S 가 . 827
가 823 , D 825 S
827

9 (909) 가

09) (951) 가 (911) (901,903, 907) (9
 (911) 가 , 가 가
 (907,903,901

(901) 903 (903) (905) 가
 가 (905) (911) (905) (951)
 가 (907) (911) 가 가 (903) (905)
 (901) (911)

10 가 (1011) (1009)
 (1051) (1009) (1007)
 가 (1011) 가 가 가
 (1011) (topology) 가

Andrew S. Tanenbaum (ISBN:0133499456)
 (FCS)

Computer Network

11 . 1101 ,
 . 1105 ,
 가 가 ,
 가 . 1107 ,
 가 . 1109 , 가
 가 1111 . 가
 , 1111 . 1113
 , 0 ,
 가 가 , 가
 가 가 , 0

12 (1201) (1251,1253,
 1255, 1257) (1251) (1201) , (1299) (1203)

(1211-1247)

(1261-127

7) (1209) (arbitrator)(1205) FIFO 가 (1203)
 (1205) (1209) 32
 32 (1207) 32

가 (1209) (1203) (1261-1277) / (1211-1247)
 1251) (1253,1255,1257,
 (1281) (1281) (1261)

13 가 가
 0 , 1301 1303 , 1301
 가

가 가 가
 1303 , 1303 1305 ,
 0 가 1305 1307 , 1307

14 , 1403 , 1401
 1407 , 1403 ,
 가
 1409 , 1405 ,
 1405 1403

(57)

1.

1

1

2.

1 , 1

3.

1 2 , 1 1

4.

3 ,

5.

4 ,

6.

4 5 ,

7.

4 6 , 1

8.

1 7 , 1

9.

1 7 , 1
2

10.

9 , ,

11.

10 , 1 1

12.

11 , 2 2

13.

11 12 ,

11 **14.** 13 ,

11 **15.** 14 ,

11 **16.** 15 , 1 2
 Obps

1 **17.** 17 , ,

17 **18.** ,

17 **19.** 18 , (high)

17 **20.** 19 ,

17 **21.** 20 ,

1 **22.** 2 1 2 (end)

- 1 , 1 2 2 2 1
 1 , , 1 2 2 2 1
 - 2 1 2 , 2 2 2 1
 2 2 , ,
 - 2 1 2

22 **23.** ,

24.

21 22 , ,
- 2 가

21 25. 24 가 , 1 가 1
가

24 26. , 1 가

21 27. 25 ,

21 28. 27 ,

21 29. 28 , 가

29 30. , 2

29 31. 30 , 2

29 32. 31 , ,
- 2 가

32 33. ,

33 34. , 0 bps

34 35. , 가

36.

33 35 ,

37.

36 , 2

38.

- 1 1 ,

- 2 2 ,

- 1 1 1 1 1 , 1

1 2 , 1 , 1 2

- 1 가 , 1 2 ,

39.

38 , ,

40.

39 ,

41.

38 40 ,

42.

41 , 1 가

43.

38 42 ,

44.

38 43 ,

45.

38 44 ,

46.

45 ,

47.

46

,

2

48.

47

,

49.

48

,

2

50.

47

49

가

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51.

47

50

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2

52.

47

51

2

,

53.

52

,

가

54.

-

1

-

-

1

1

55.

-

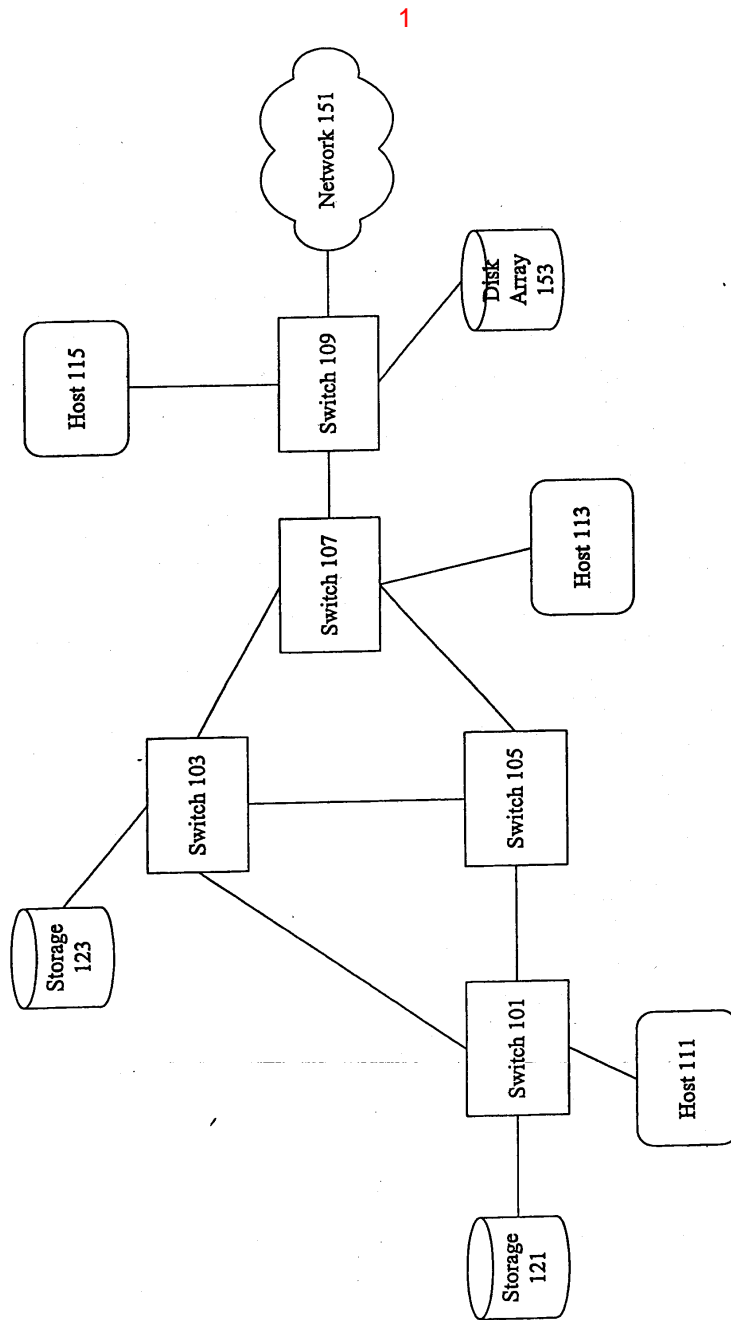
1

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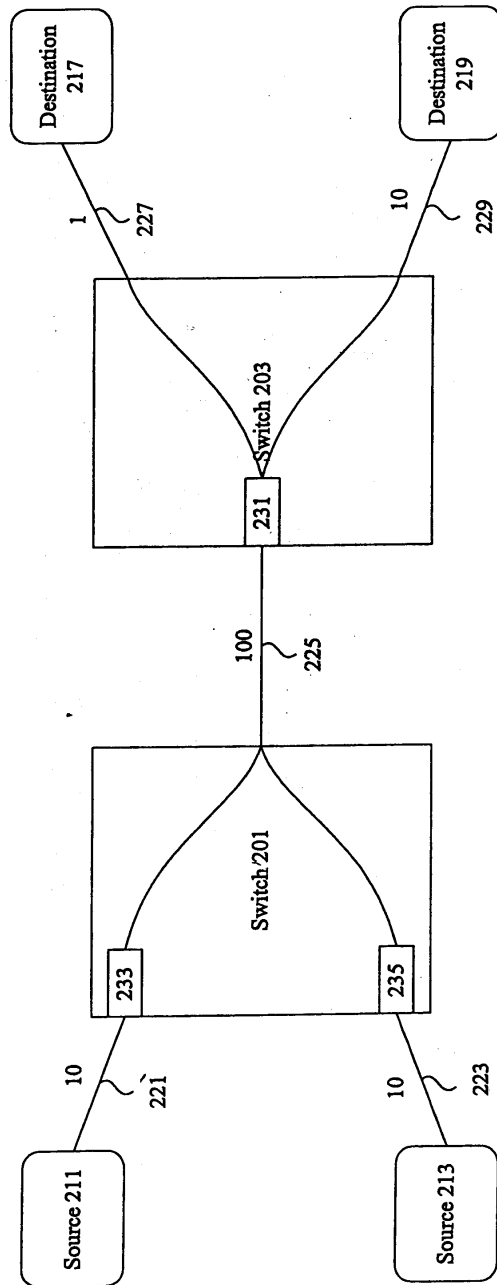
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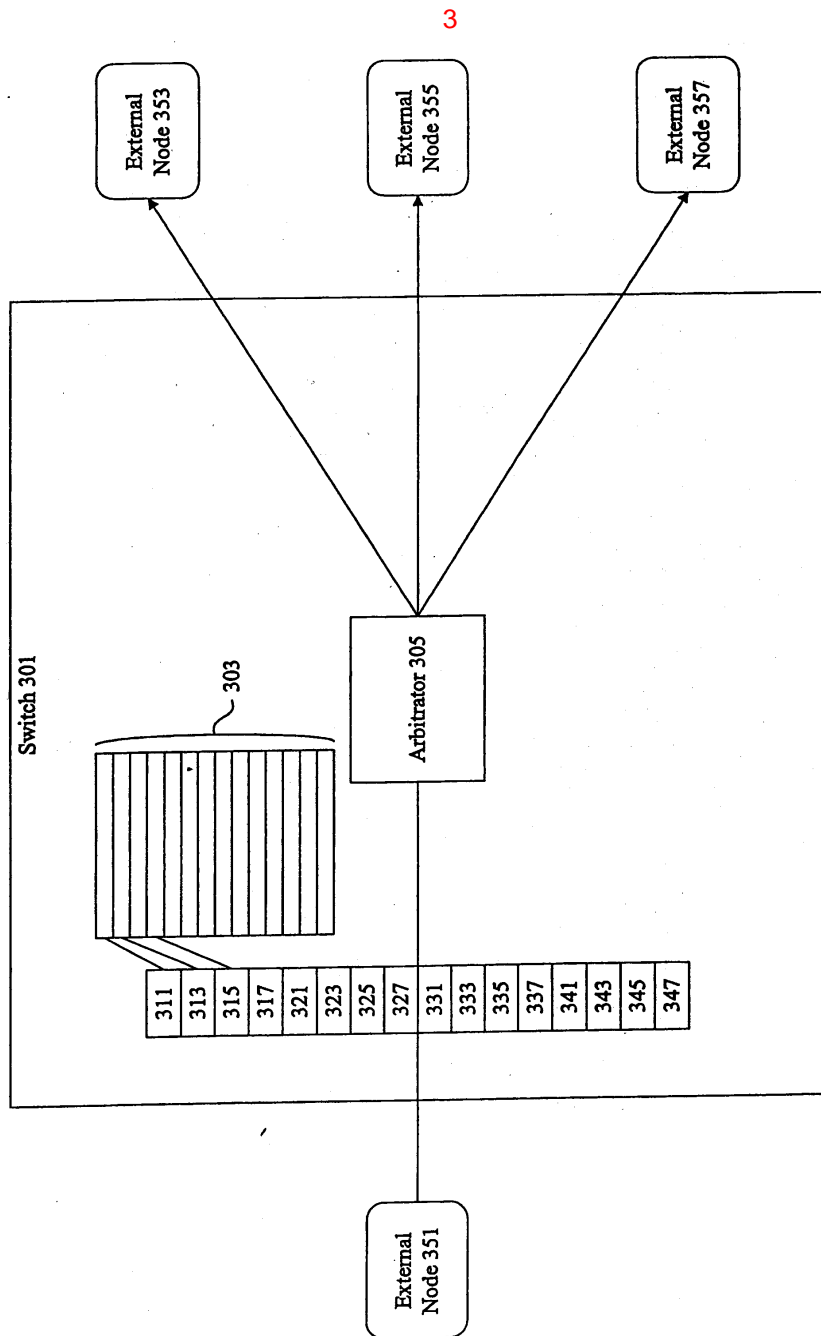
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1



2



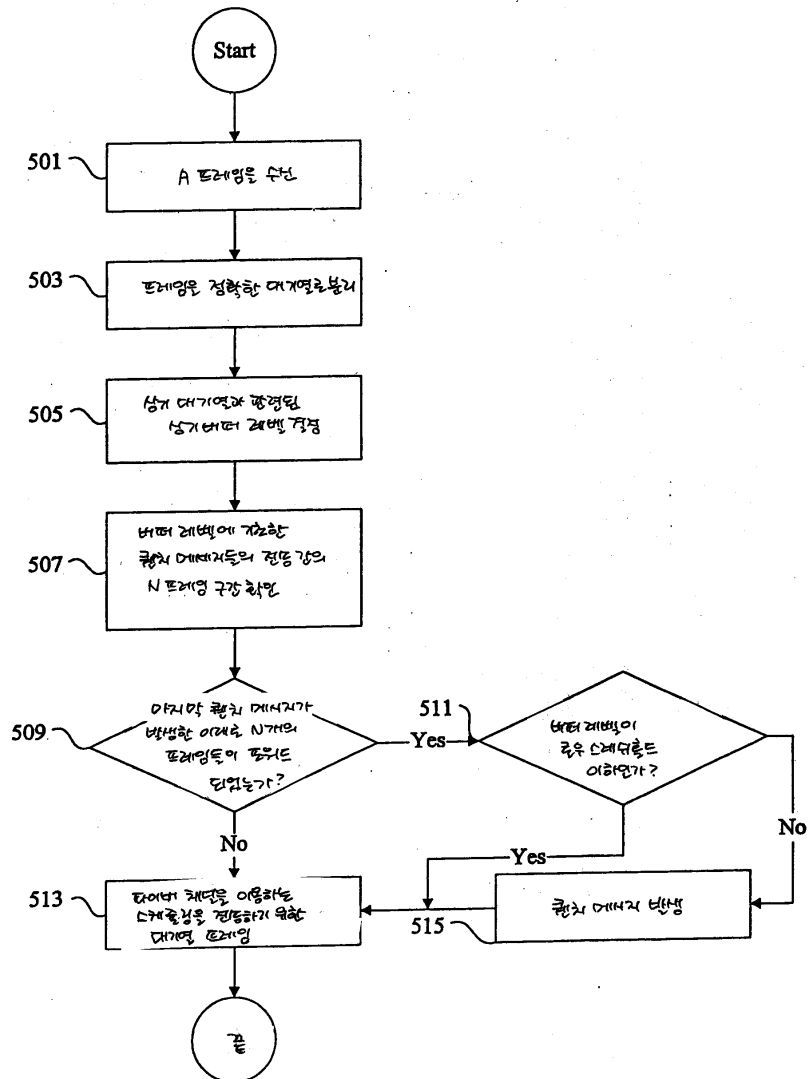


4

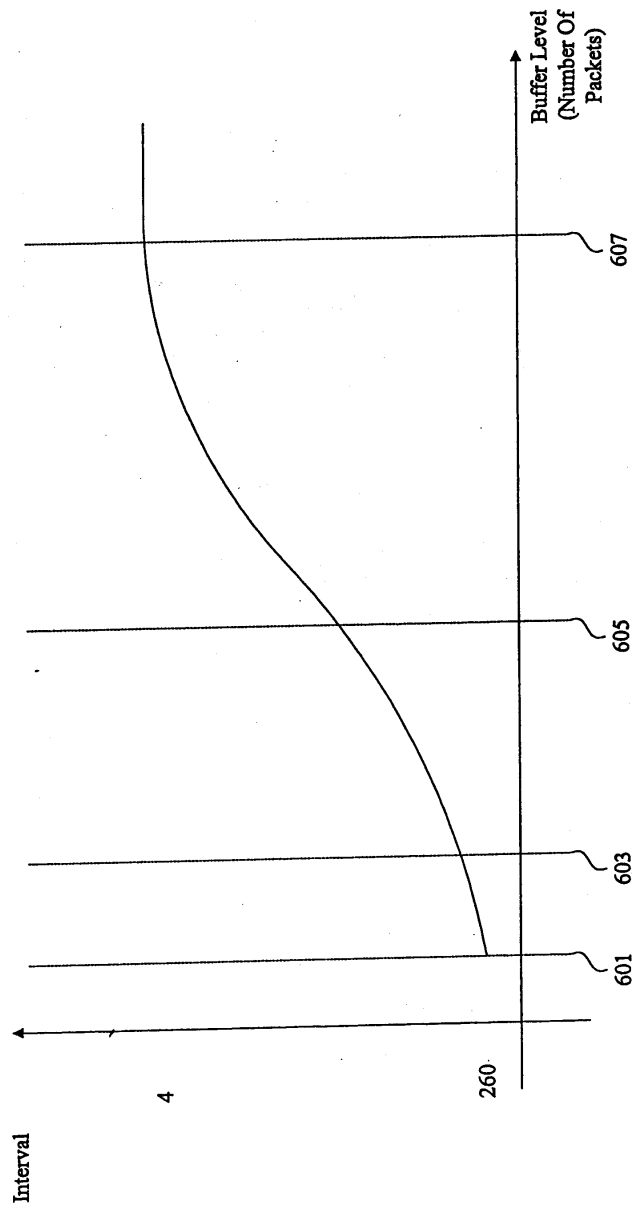
401

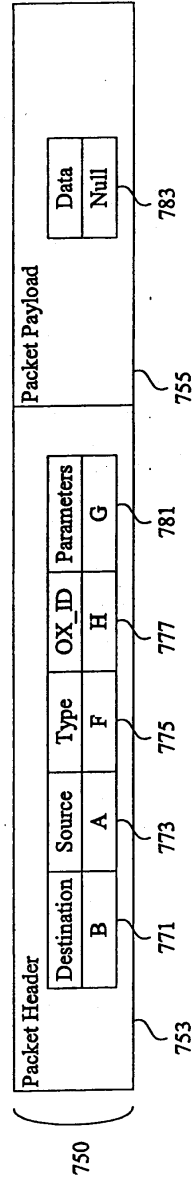
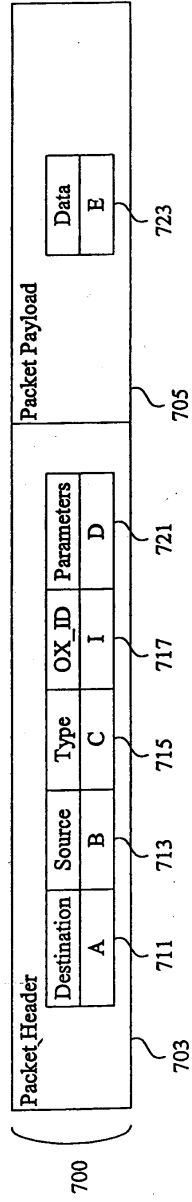
	403	405
	대기열 내의 대기량의 변분	구간
411	0-10	---
413	11-15	260
415	16-31	132
417
419	112-127	6

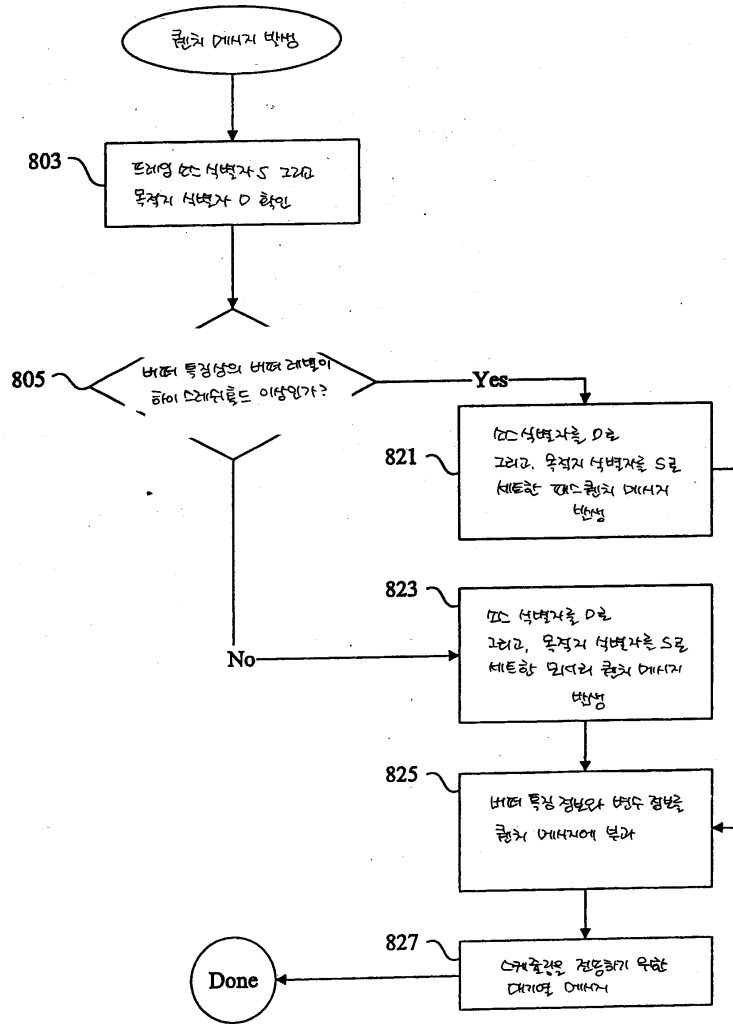
5



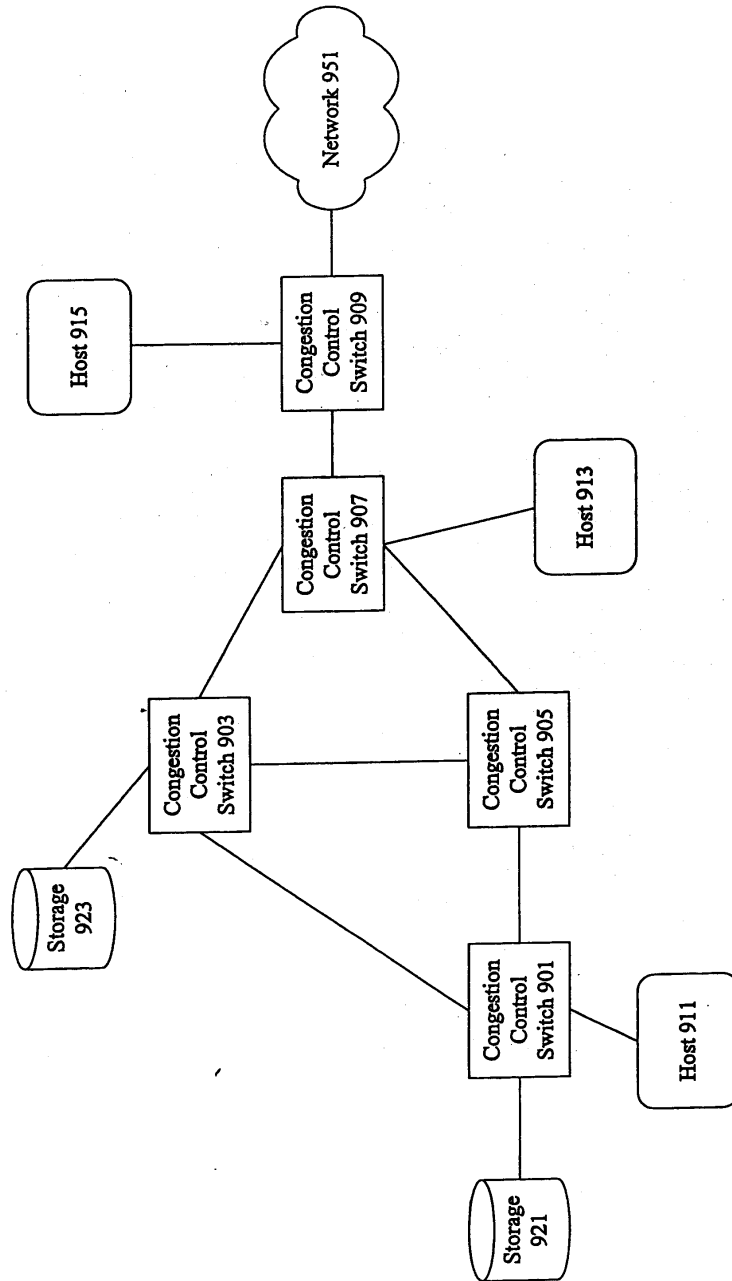
6



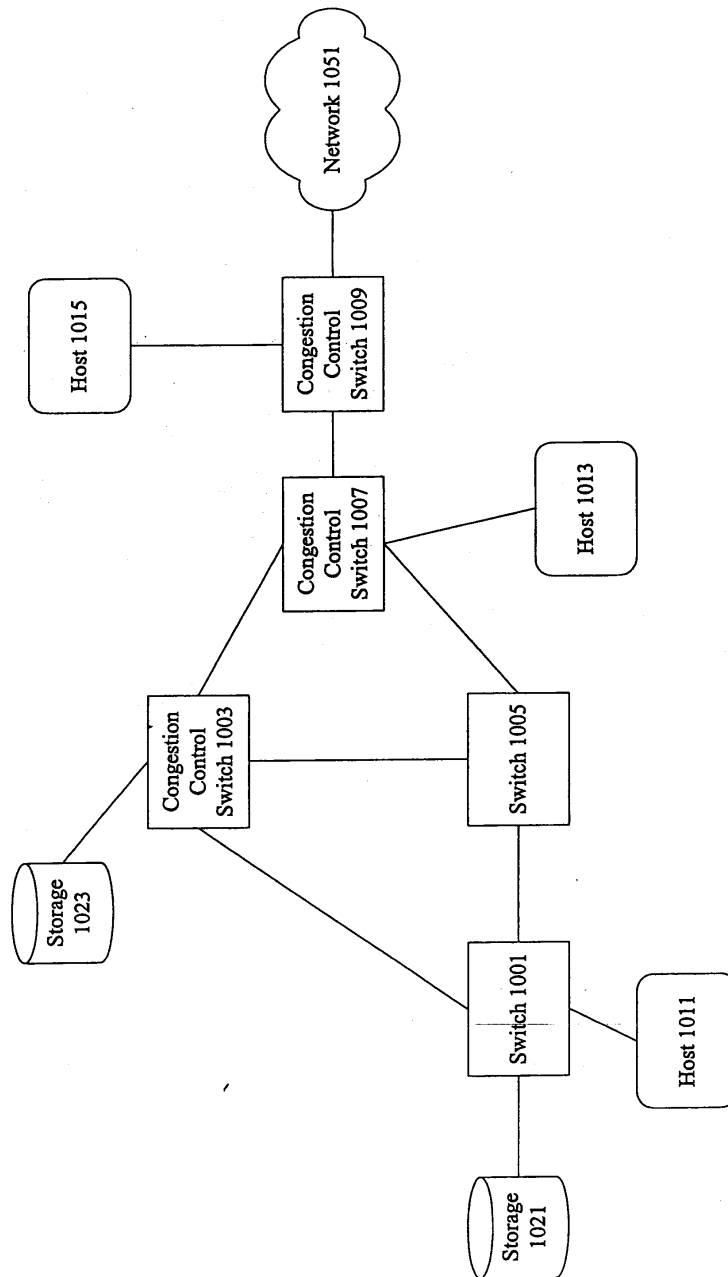


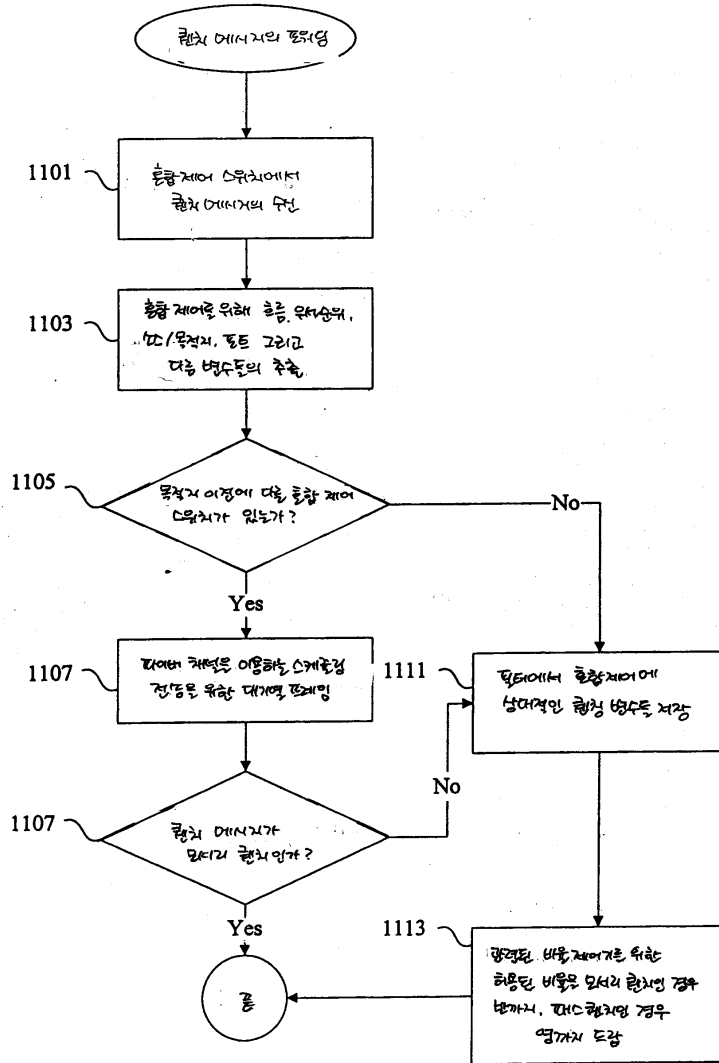


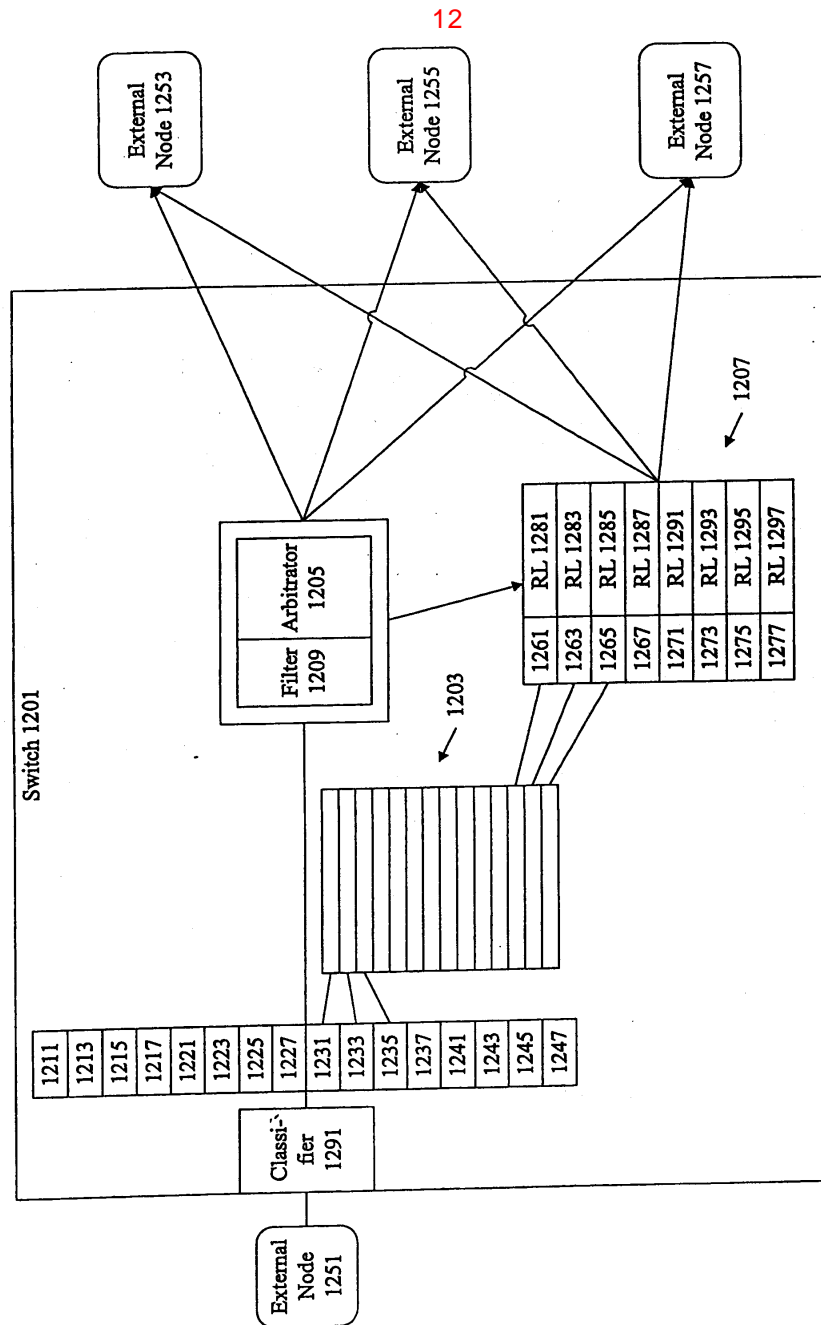
9



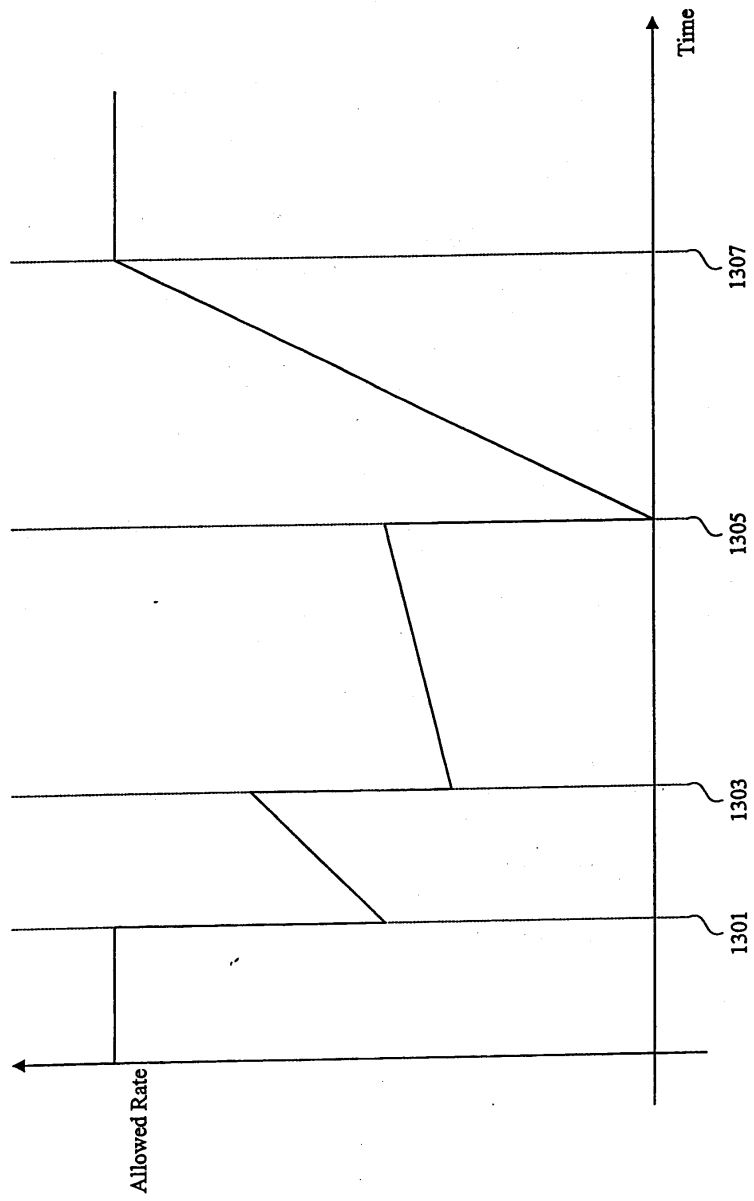
10







13



14

