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2004 09 13

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(22) 2002 12 23

(65)
(43)

10-2004-0056309
2004 06 30

(73) 가 161

(72) 205 601

111 1402

가 236-1

(74)

:

(54)

-

o copy / zero copy , zer
NSU , ,
가 , 가
TOE .

2

NSU, TOE, PCI , TCP/IP, iSCSI, Zero Copy,

1
2
3
4
5
6
< >
10: 20:
30: 40:
50: 60:
70: 100: -
110: PCI 120: PCI
130: 140: PCI
150: TOE 170: PCI
180: MAC

VoD (Video-on-Demand), NoD (News-on-Demand)
가
가
가
가
TCP/IP T
OE (TCP/IP Offload Engine)
TOE 가 TCP/IP TCP/IP 90%
TOE TOE TCP/IP TOE ASIC
USA-P 6,427,173 B1 (; Intelligent network Interfaced Device and System For
Accelerated Communication)가
TOE 가
가
I/O TCP/IP iSCSI I/O iSCSI SCSI
iSCSI USA-P 6,400,730 (Method and apparatus for transferring
data between IP network devices and SCSI and fibre channel devices over an IP network)가
iSCSI 가
가
QoS

QoS

가

가

zero copy

zero copy

, NSU

; NSU

, NSU

; NSU

가

;

가

TOE;

1

1

(10)

(20)

(20)

(40)

(50)

(30)가

(30)

(10)

(20)

(40)

(50)

(50)

PCI가

(100)

(50)

가

가

(Network-Storage Unit,

NSU ,100)

(50)

(60),

(Ethernet)

(70)

(30)

(10)

(60)

(70)

2

(NSU)

2

NSU(100)

(110)

(130)

(140)

(170) , TOE(TCP/IP Offload Engine,150) MAC(Medium Access Cont

rol,180)

(110)

(10)가

NSU(100)

(30)

(50)

NSU(100)

(120)

)

(110)

가

NSU(100)

가

PCI가

(110) PCI

PCI

(110)

(NSU)

(10)

(40)

(30)

PCI

NSU(100) (120) (50)

가 NSU(100) (50) (50) (120)가 , (50) , (

50)가 PCI , PCI 32 . NSU(100)가 가 133 Mbyte/sec 가 ,

1 Gbps NSU(100) (120) (50) , PCI

가 (130) (60)

NSU(100) (130) (60) (60)

(stripping) (10) (70) (60)

가 가

가

160 MBps (160) 320 MBps SCSI SCSI

NSU(100) (170)

가 (170) (140) (60) (70)

NSU(100) (170)가 (60) PCI (170)가 (60)

NSU(100) (170) (140) (170) DMA NSU(100) 가

TOE(150) TOE 가

TOE TCP/IP 가

TOE 가 TOE TOE

(60) (70)

(60) (170)

(170) 가 가 (70)

TOE(150) (40) (170) (10)

(50)

(70) (60) 가 TOE(150) (

60) (140)

(50) 가 TOE(150)

(70) (60) (60)

(10) NSU(100)

3 offload

3 TOE(150)

3 TOE(150) (10) DSB

(S301)

DSB(Disk Save Buffer Table) (60)
가
DSB가 (70) .(S302)
, 가 TOE(150) .(S303)
, 가 (60) 가 ,(S304)
가 DSB 가 .(S305)
.(S306) , DSB 가 NSU(100) (170) .(S307)
가 ,(S308,S309)
, 4 TOE(150)
, (60) (170) (170)
.(S401) (10) (70)
, TOE(150) (170) .(S402)
가 TOE (150)
,(S403) 가 (170)
,(S404) 가 (70) .(S405)
, .(S406)
6) , 5 (130)
(10) ,(S501) (130)
.(S502) (120)
(60) .(S503)
.(S504) (60) .(S505)
,(S506)
6 (140) (170)
(170) (140)
.(S601)
, NSU(100) (170) (140)
가 (170)
(140)
.(S602)
(60) (170)
, (170)
,(S603) (170)
,(S604) (170) (140) .(S605)
,(S606) 가 .(S606)
7)

zero copy

/

QoS

가

가 가

(57)

1.

- , , NSU ; ;
NSU , NSU ;
NSU ;
가 ;
가 TOE;

2.

1 , PCI 가 , PCI

3.

1 ,
-

4.

1 ,
-

5.

1 ,
-

6.

1 ,
DMA

7.

1 ,
-

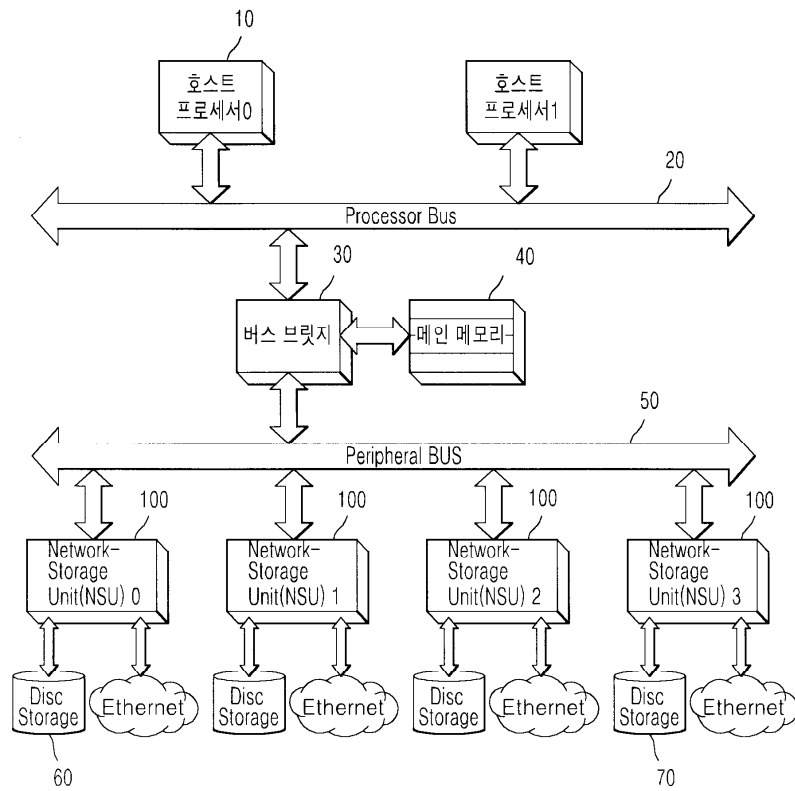
8.

1 , TOE , DSB , 가 DS
B 가 ,

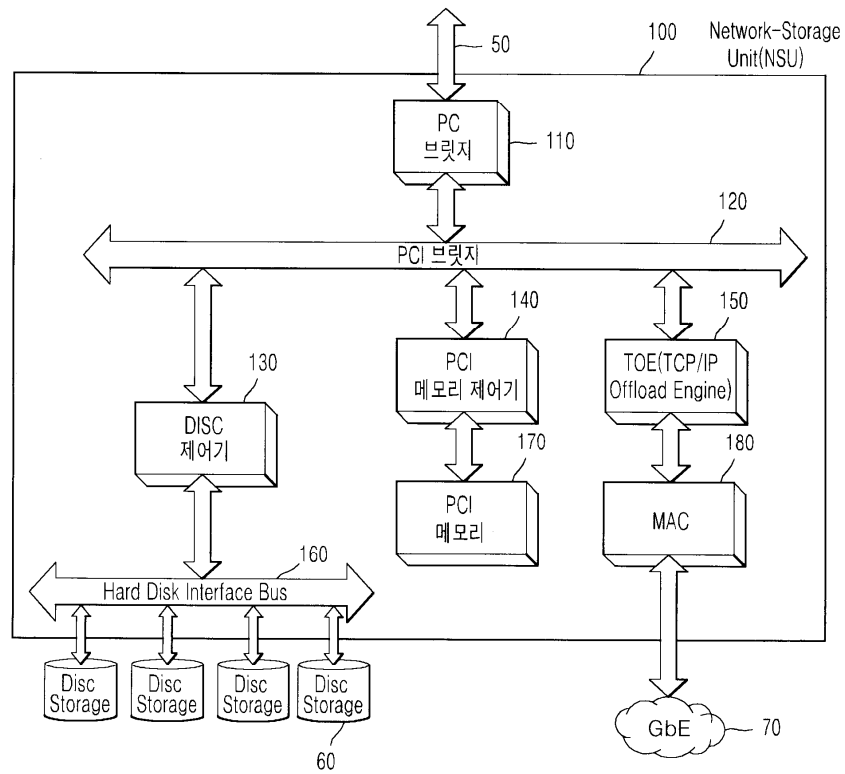
9.

1 , TOE , 가
가

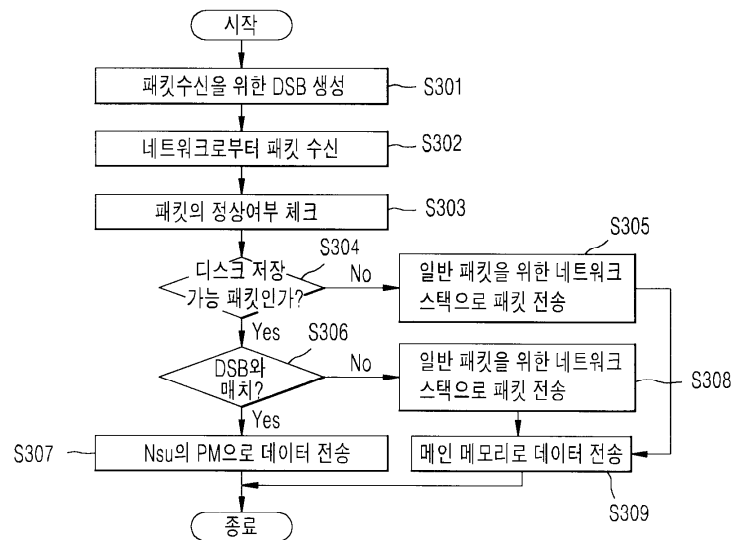
1



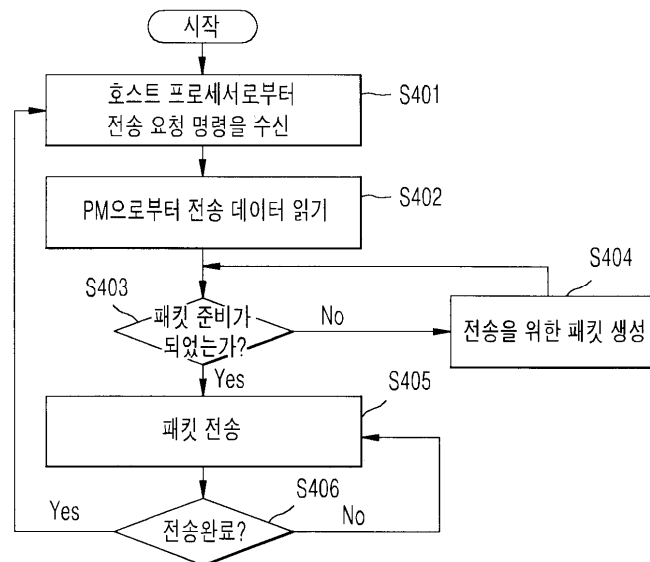
2



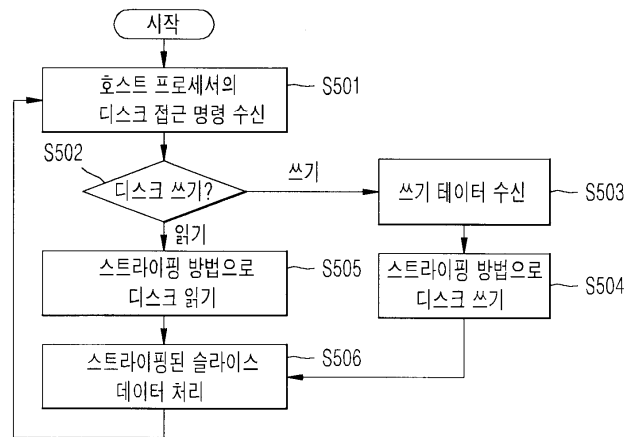
3



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6

